CCD-FX600/FX620
RMT-509

SERVICE MANUAL

US Model
CCD-FX620
E Model
CCD-FX600

SONY
SONY
12x Handycam
Hi-Fi Stereo
Video 8

Photo: **CCD-FX620**

Remote commander is available as a unit, but as individual parts the battery case lid of commander is only available.

Video 8
Handycam

A MECHANISM

These models are based on the original models CCD-FX500/FX510 with additional functions of × 12 lens and mosaic fader, deleting title function.

For MECHANISM ADJUSTMENTS, refer to the "8 mm Video MECHANICAL ADJUSTMENT MANUAL Ⅳ" (9-973-199-11).

SPECIFICATIONS

System

Video recording system	Rotary two heads, Helical scanning FM system
Audio recording system	Rotary head, FM system
Video signal	NTSC color, EIA standards
Usable cassette	8 mm video format cassette
Tape speed	SP mode: Approx. 1.43 cm ($^{19}/_{32}$ inch)/sec. LP mode: Approx. 0.72 cm ($^{5}/_{16}$ inch)/sec. (playback only)
Recording time	SP mode: 2 hours (P6-120)
Playback time	SP mode: 2 hours (P6-120) LP mode: 4 hours (P6-120)
Fast-forward/rewind time	Approx. 6 min. 30 sec. (P6-120)
Image device	CCD (Charge Coupled Device)
Viewfinder	Electronic viewfinder (black and white)
Lens	Combined 12 x power zoom lens f=6.0 to 72 mm ($^{1}/_{4}$ to 2$^{7}/_{8}$ inches) Approx. 44 to 528 mm (1$^{3}/_{4}$ to 20$^{3}/_{4}$ inches) converted into the focal length of a 35-mm still camera. F 1.8 to 2.8 with macro Filter diameter: 37 mm (1$^{1}/_{2}$ inches) TTL autofocus system inner focus wide macro system
Color temperature	Auto
Minimum illumination	2 lx
Illumination range	2 lx to 100,000 lx (0.2 to 9294 footcandles)
Recommended illumination	More than 100 lx (9 footcandles)
Aperture correction	Automatic With backlight adjustment

Input and output connectors

Video input/output	Phono jack, 1 Vp-p, 75 ohms unbalanced sync negative
Audio input/output	Phono jack (L, R) Input: –7.5 dBs, input impedance more than 47 kilohms Output: –7.5 dBs, (at load impedance 47 kilohms) impedance less than 1 kilohm
RFU DC OUT	Special minijack, 5 V DC
Headphone jack	Stereo minijack, 8-ohm impedance
Remote ◐ jack	Stereo mini-minijack
MIC jack	Stereo minijack, –66 dBs, low impedance with 2.5 to 3 V DC output, impedance 6.8 kilohms

Microphone power output jack special minijack, 5 V DC

– Continued on next page –

MICROFILM

8 VIDEO CAMERA RECORDER

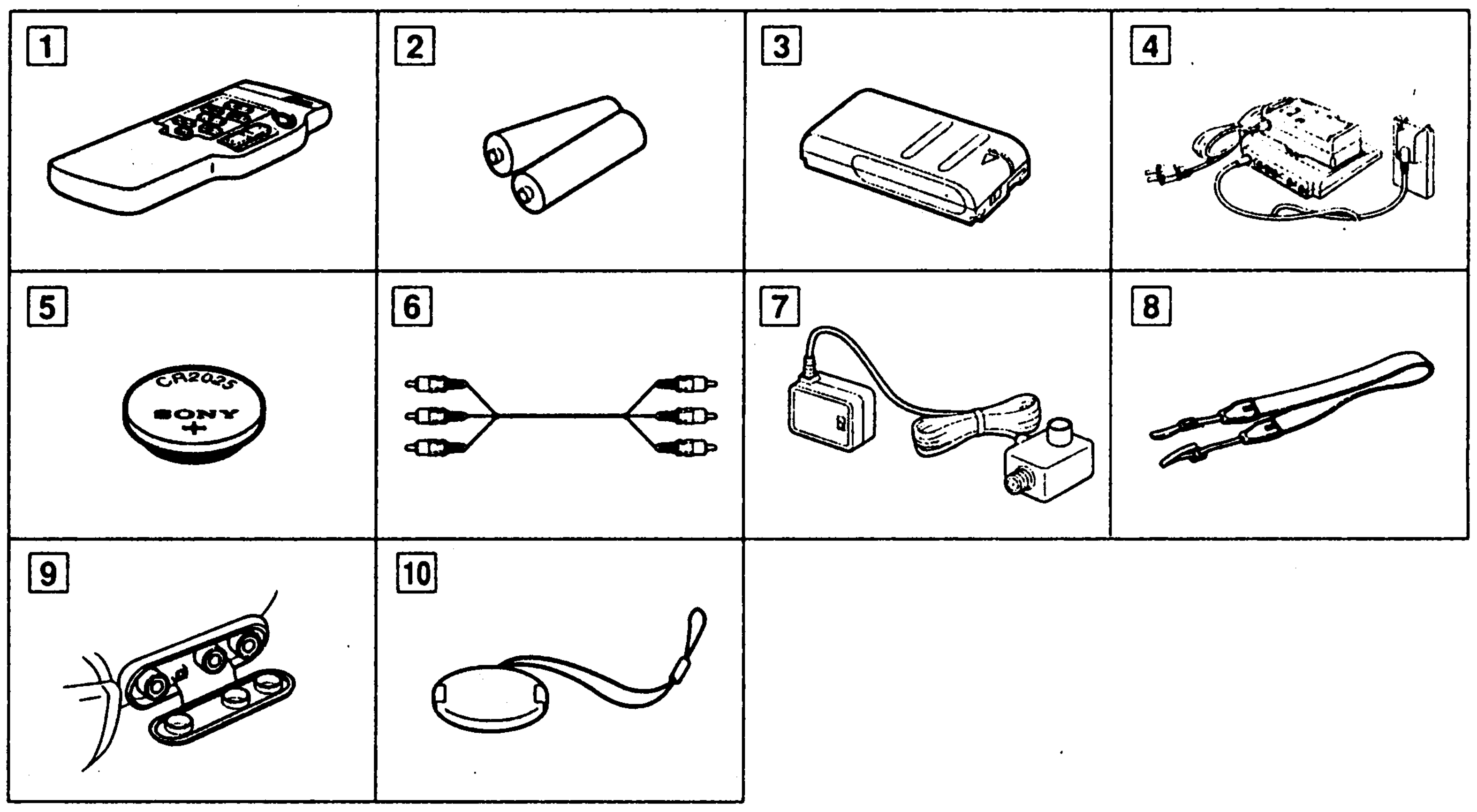
SONY®

General

Power requirements	On battery mounting surface 6.0 V (battery pack) 7.5 V (AC power adaptor)
Power consumption	6.0 W (camera recording) including the viewfinder
Installation	Vertically, horizontally
Operating temperature	32°F to 104°F (0°C to 40°C)
Storage temperature	–4°F to +140°F (–20°C to +60°C)
Dimensions	Approx. 118 × 108 × 267 mm (w/h/d) ($4^{3}/_{4} \times 4^{3}/_{8} \times 10^{1}/_{2}$ in.)
Mass	Approx. 860 g (1 lb 14 oz) excluding the battery pack, lithium battery, and cassette Approx. 1100 g (2 lb 6 oz) including the battery pack NP-55, lithium battery CR2025, and cassette P6-120
Microphone	Electret condenser microphone, omnidirectional, stereo type
Supplied accessories	See page 5.

Checking Supplied Accessories

Check that the following accessories are supplied with your camcorder.



1 Wireless Remote Commander (1) (p. 26)
2 Size AA (R6) Batteries for Remote Commander (2) (p. 26)
3 Battery Pack NP-55 (1) (p. 6)
4 AC Power Adaptor AC-V25S (1) (p. 6)
5 Lithium Battery CR2025 (1) (p. 10)
6 A/V Connecting Cable (1) (p. 22)
7 RFU Adaptor RFU-90UC (1) (p. 23)
8 Shoulder Strap (1) (p. 49)
9 Jack Cover (1) (attached to the camcorder)
10 Lens Cap (1) (attached to the camcorder) (p. 17)

SAFETY CHECK-OUT

After correcting the original service problem, perform the following safety checks before releasing the set to the customer:

1. Check the area of your repair for unsoldered or poorly-soldered connections. Check the entire board surface for solder splashes and bridges.
2. Check the interboard wiring to ensure that no wires are "pinched" or contact high-wattage resistors.
3. Look for unauthorized replacement parts, particularly transistors, that were installed during a previous repair. Point them out to the customer and recommend their replacement.
4. Look for parts which, though functioning, show obvious signs of deterioration. Point them out to the customer and recommend their replacement.
5. Check the B+ voltage to see it is at the values specified.

SAFETY-RELATED COMPONENT WARNING!!

COMPONENTS IDENTIFIED BY MARK ⚠ OR DOTTED LINE WITH MARK ⚠ ON THE SCHEMATIC DIAGRAMS AND IN THE PARTS LIST ARE CRITICAL TO SAFE OPERATION. REPLACE THESE COMPONENTS WITH SONY PARTS WHOSE PART NUMBERS APPEAR AS SHOWN IN THIS MANUAL OR IN SUPPLEMENTS PUBLISHED BY SONY.

ATTENTION AU COMPOSANT AYANT RAPPORT À LA SÉCURITÉ!

LES COMPOSANTS IDENTIFIÉS PAR UNE MARQUE ⚠ SUR LES DIAGRAMMES SCHÉMATIQUES ET LA LISTE DES PIÈCES SONT CRITIQUES POUR LA SÉCURITÉ DE FONCTIONNEMENT. NE REMPLACER CES COMPOSANTS QUE PAR DES PIÈCES SONY DONT LES NUMÉROS SONT DONNÉS DANS CE MANUEL OU DANS LES SUPPLÉMENTS PUBLIÉS PAR SONY.

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There is the color reproduction standard frame at the back of the book.

SERVICE NOTE

[SEMICONDUCTOR FOR CORRECTION LIST DISPLAY]

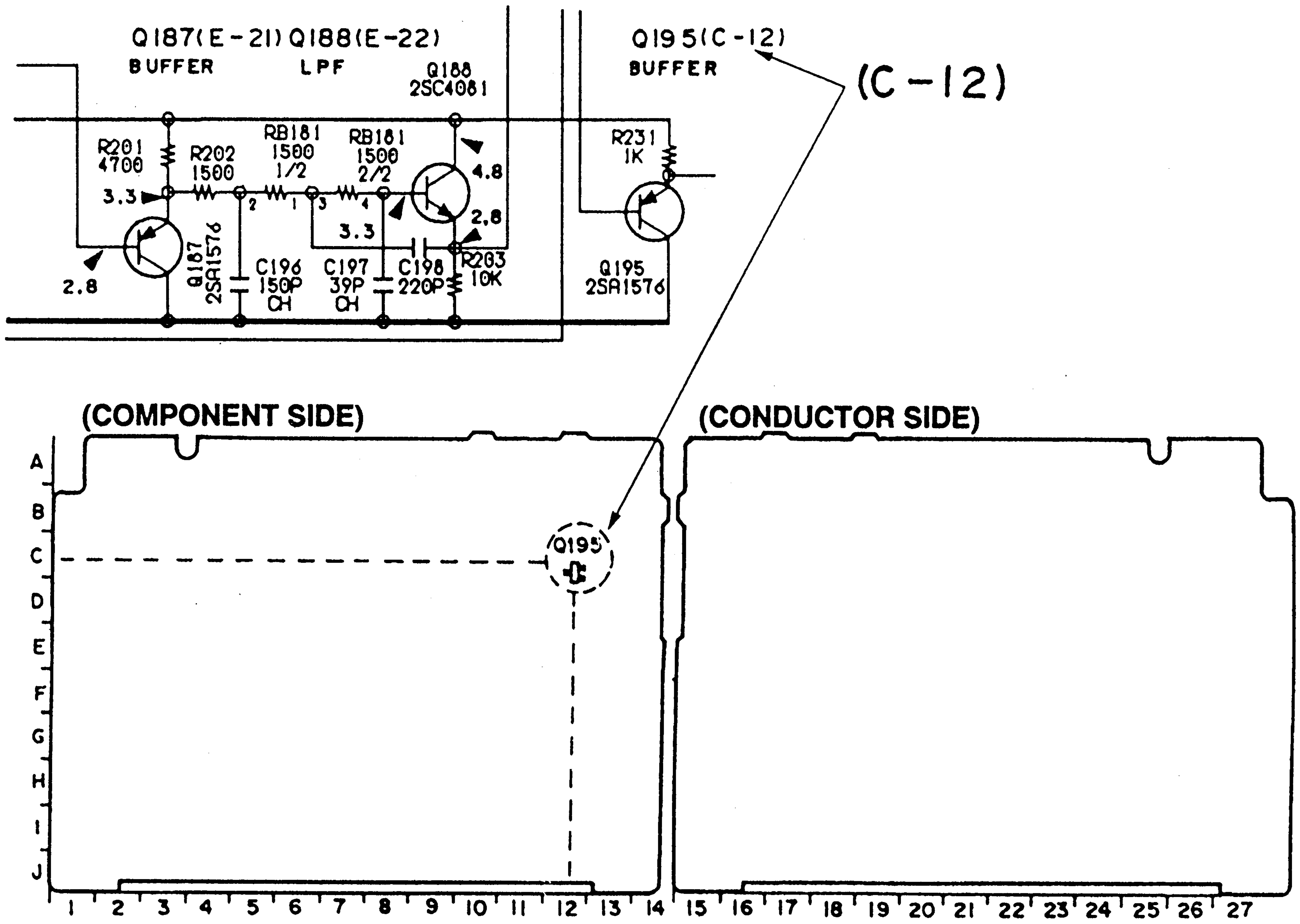
Part code and part name of the semiconductor for correction of the print board is discribed in the space of each print figure. Use this list when ordering parts.

[PARTS LOCATION DIAGRAM RELATED TO POWER SUPPLY]

The parts location diagram for the power supply which are often checked and replaced when repairing the fuse and IC link and so on. (See pages 103 and 123.)
This diagram is useful for repair.

[SEMICONDUCTOR LOCATION]

In this service manual, the mounted locations of the semiconductors (IC, transistor, diodes) are indicated in red as shown below. This enables to find the location on the board easily when servicing.



Q187(E-21) Q188(E-22)
BUFFER
LPF
Q188
2SC4081
Q195(C-12)
BUFFER
(C-12)
R201
4700
R202
1500
RB181
1500
1/2
RB181
1500
2/2
4.8
3.3
2.8
3.3
2.8
Q187
2SA1576
C196
150P
CH
C197
39P
CH
C198
220P
R203
10K
R231
1K
Q195
2SA1576
(COMPONENT SIDE)
(CONDUCTOR SIDE)
Q195
A
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[HEAD CLEANING]

After an extended period of use the video image may become indistinct or may not appear at all during playback of a tape. The cause of this usually are dirty video heads. For remedy, cleaning of the heads is required.

Check for Head Clogs During Recording

① Use a blank tape, record a short section, then press the stop button to stop.
② Set to recording mode again.
③ If the [✪] mark is flashing in the viewfinder at this time, head clogs are occurred.

Check During Playback of a Tape

① Play back a pre-recorded tape and display the image on a TV screen.
② If there is no sound and the image is unstable, no image appears on the screen, or tape transport is unstable, head clogs are occurred.

Remedy

[Cleaning method using a cleaning tape]

- Use the Cleaning Tape. (Please follow the instructions attached to the cleaning tape.)

CCD-FX600/FX620

SECTION 1
GENERAL

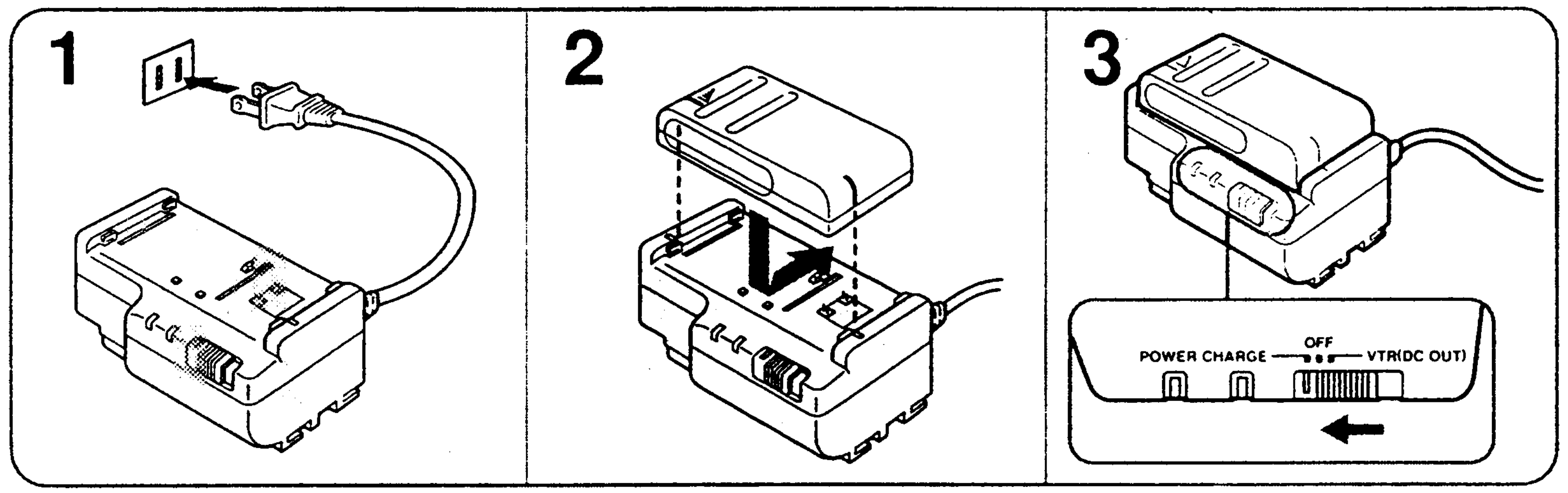
This section is extracted from instruction manual of CCD-FX620.

Charging and Installing the Battery Pack

Before using your camcorder, you need to charge and install the battery pack. The supplied battery pack is not charged when you purchase the camcorder. Use the supplied AC-V25S AC Power Adaptor for charging.

Charging the Battery Pack

(1) Connect the power cord of the AC power adaptor to a wall outlet. (2) Attach the flat side of the battery pack to the AC power adaptor by aligning the lines on the AC power adaptor and battery pack. While pressing the battery pack, slide it in the direction of the arrow until it clicks. (3) Set the VTR (DC OUT)/CHARGE selector to CHARGE. The POWER lamp and CHARGE lamp will light up. The charging will begin.
When the battery is fully charged, the CHARGE lamp goes out. Set the VTR (DC OUT)/CHARGE selector to OFF. The POWER lamp goes out. Then disconnect the power cord from the wall outlet.



Detaching the Battery Pack from the AC Power Adaptor

Slide the battery pack in the opposite direction of the arrow on the battery pack.

Charging time and battery life

Type of battery pack	NP-55 (supplied)	NP-77H NP-77HD	NP-77	NP-66H	NP-55H
Required charging time*	70	160	140	120	80
Battery life**	50	110	90	85	60

* Approximate minutes using AC-V25S
** Approximate minutes, continuous recording when used indoor

Important!

Use the battery completely before charging!

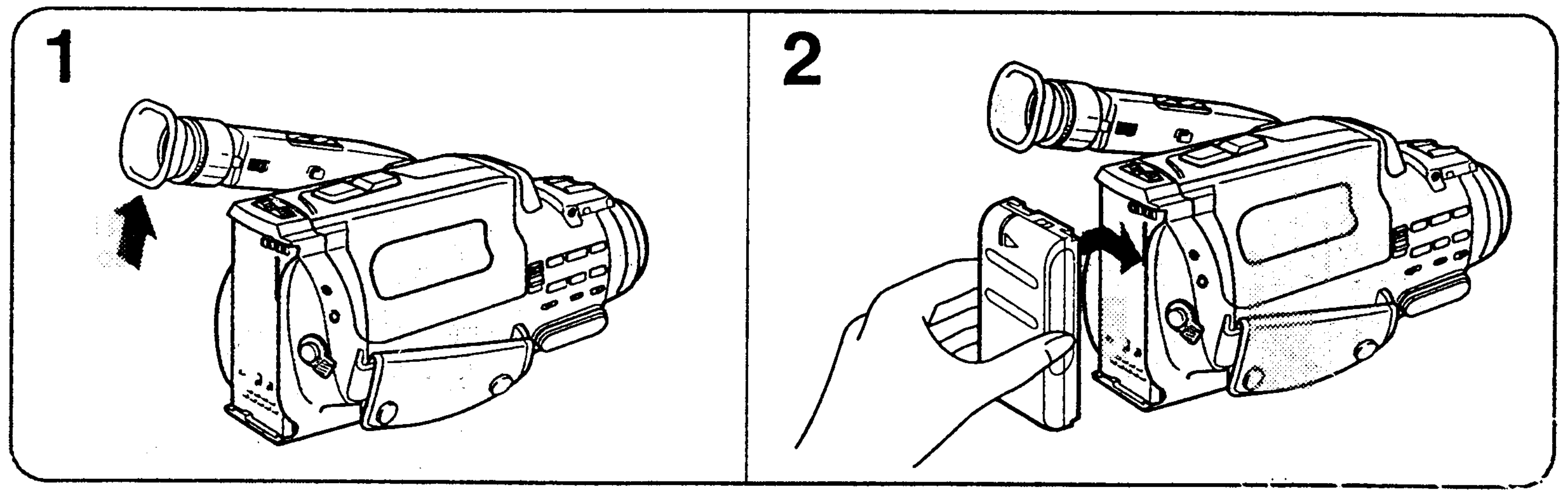
Before you charge the battery, make sure it has been used (discharged) completely to avoid capacity down of the battery caused by excessive charging.

To use up the battery, remove the video cassette and simply slide the POWER switch on the camcorder to CAMERA with the battery attached, and leave the camcorder until the ▭ indicator appears flashing and a red lamp flashes in the viewfinder. The ▭ indicator also flashes in the display window.

Notes on the AC power adaptor
- The camcorder cannot be operated while charging the battery pack.
- The POWER lamp will remain lit for a while even if the battery pack is detached and the power cord is disconnected after charging the battery pack. This is normal.
- If the POWER lamp does not light, set the VTR(DC OUT)/CHARGE selector to OFF and disconnect the power cord. After about one minute, reconnect the power cord and set the VTR(DC OUT)/CHARGE selector to CHARGE again.

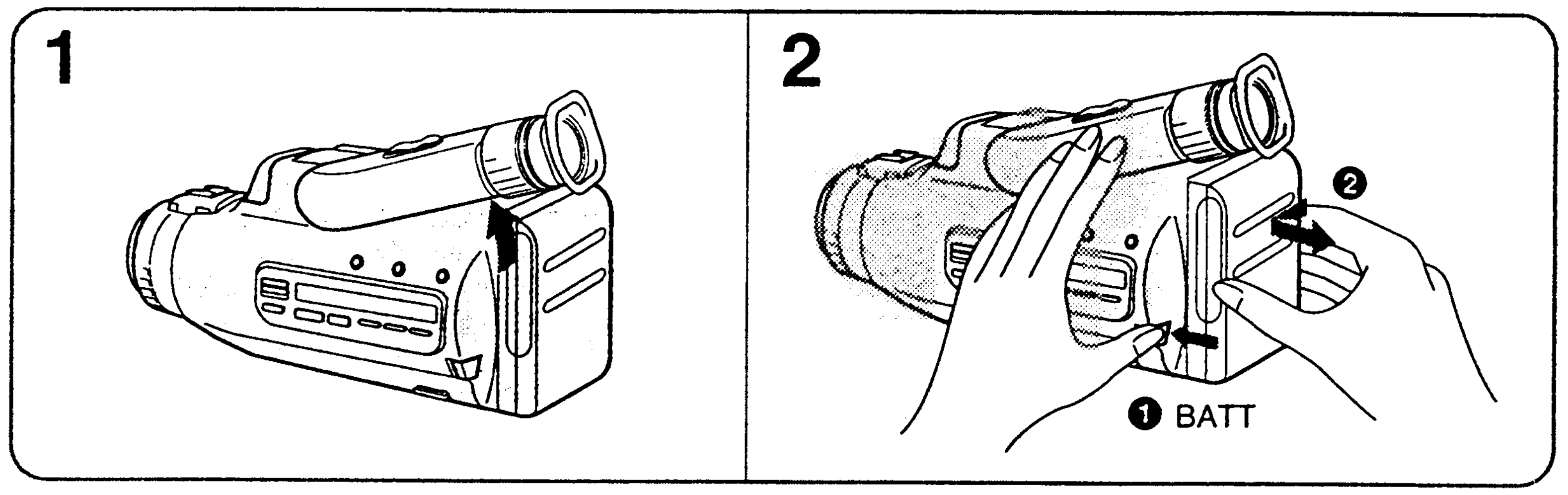
Installing the Battery Pack

(1) Lift up the viewfinder barrel. (2) Make sure you hold the battery pack properly. Align the right side of the battery pack with the white line on the camcorder. While pressing the battery pack, slide it to the right until it clicks.



Detaching the Battery Pack

(1) Lift up the viewfinder barrel. (2) While pressing BATT in the direction of the arrow, and slide out the battery pack to the left.



Tips for Using the Battery Pack

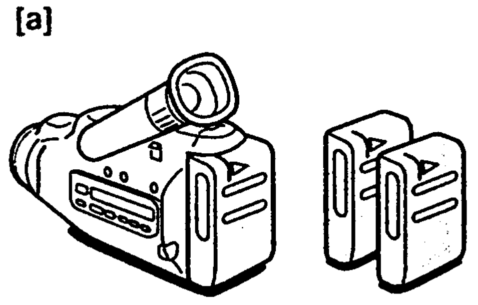
Preparing the Rechargeable Battery Pack

Have sufficient battery pack power to do 2 or 3 times as much recording than you have planned [a]
"Battery life" indicated in this manual is measured by the continuous recording time of the camcorder, at room temperature using a fully charged battery.

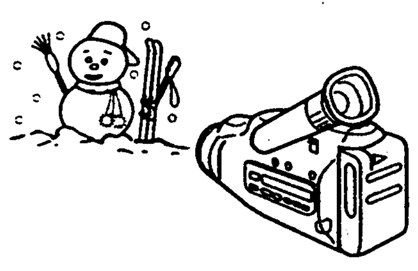
Battery life is shorter in cold climates [b]
Battery efficiency is decreased and the battery will be used up more quickly.

Turn STANDBY of the camcorder down when not recording to save battery power [c]
A smooth transition between scenes can be made even if recording is stopped and started again.
While positioning the subject or selecting an angle, or looking through the viewfinder lens, the lens moves automatically inside the camcorder and the battery is used. The battery is also used when a tape is inserted or ejected.

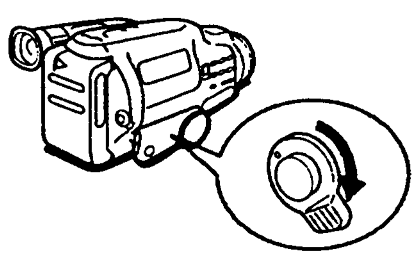
[a]



[b]



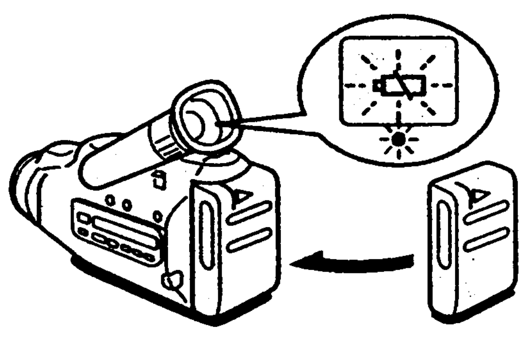
[c]



When the Rechargeable Battery Pack Should Be Replaced

When the ▭ indicator and red lamp in the viewfinder, and the ▭ indicator in the display window change from slow blinking to rapid blinking while you are recording [d]
Turn off the power switch of the camcorder and replace the battery pack. Leave the tape in the camcorder to obtain a smooth transition between scenes after the battery pack is replaced.

[d]



Notes on Charging

Before using the battery pack, charge it sufficiently
A brand-new battery pack is not charged.

Make sure you use up the battery before recharging

- If recording is completed before the ▭ indicator appears in the viewfinder, you should remove the tape, set the POWER switch to CAMERA, turn STANDBY up before recharging. Leave the camcorder until the ▭ indicator blinks rapidly which means the battery is used up.
- When you use the AC-S10 AC Power Adaptor, the DC-S10 Car Battery Charger or BC-S10 Portable Battery Charger, you can discharge the battery with their discharging function.
- Repeated charging without using up the battery may lower battery capacity. However, the original battery capacity can be recovered if you fully discharge (use up) and then charge the battery again.

Recharge the battery pack after long storage
If the battery pack is charged fully but then not used for a long time (about 1 year), it becomes discharged. Charge it again but in this case the battery life will be shorter than normal.
After several charging and discharging cycles, the battery life will recover its original capacity.

Keep the Terminals Clean [e]

If the terminals (metal parts on the back) are not clean, the battery duration will be shortened.
When the terminals are not clean or when the battery pack has not been used for a long time, install and detach the battery pack from time to time. This will improve the contact condition. Also, wipe the + and – terminals with a soft cloth or paper.

Notes on the Rechargeable Battery Pack

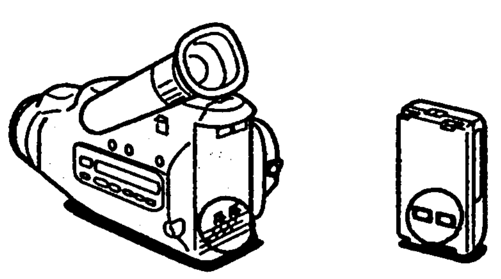
Why the battery pack heats up? [f]
During charging or recording, the battery pack heats up. This is caused by energy that has been generated and chemical change has occurred inside the battery pack, and this is not cause for concern.

How to care for the battery pack

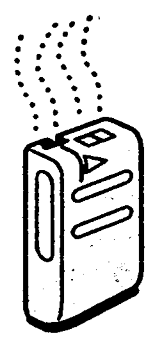
- Detach the battery pack from the camcorder after using it, and keep it in a cool place. When the battery pack is on the camcorder, a small amount of current flows to the camcorder even if power is turned off. This causes overdischarging and shortens battery life.
- A charged battery pack always discharges even when it is not in use after charging.
  Thus, it is recommended that you charge the battery right before using.

How to use the switch on the battery pack [g]
This switch is provided so that you can remember the charging status. Set the switch to the "no mark" position when charging is completed. Set the switch to the "red mark" position when the battery is used up.

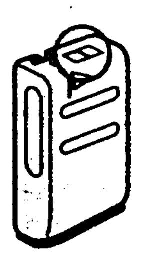
[e]



[f]



[g]



How many times can the battery pack be recharged?
The battery pack can be fully charged and discharged about 500 times under normal temperatures. If the ▭ indicator flashes rapidly just after turning on the camcorder with a fully charged battery pack, the battery pack should be replaced with a new fully charged one.

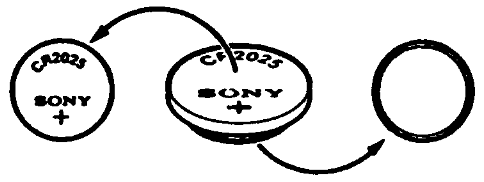
Recommended temperatures during charging
The temperature range of charging is 41°F to 95°F (5°C to 35°C). However, to provide maximum battery efficiency, the recommended temperature range when charging is 50°F to 86°F (10°C to 30°C).

Be sure to observe the following:

- **To prevent an accident caused by a short circuit, do not allow metal objects such as a necklace to touch the battery terminals. Carry the battery pack attaching to the terminal cover.**
- Keep the battery pack away from fire.
- Keep the battery pack dry.
- Do not open nor convert the battery pack.
- Do not expose the battery pack to any mechanical shock.

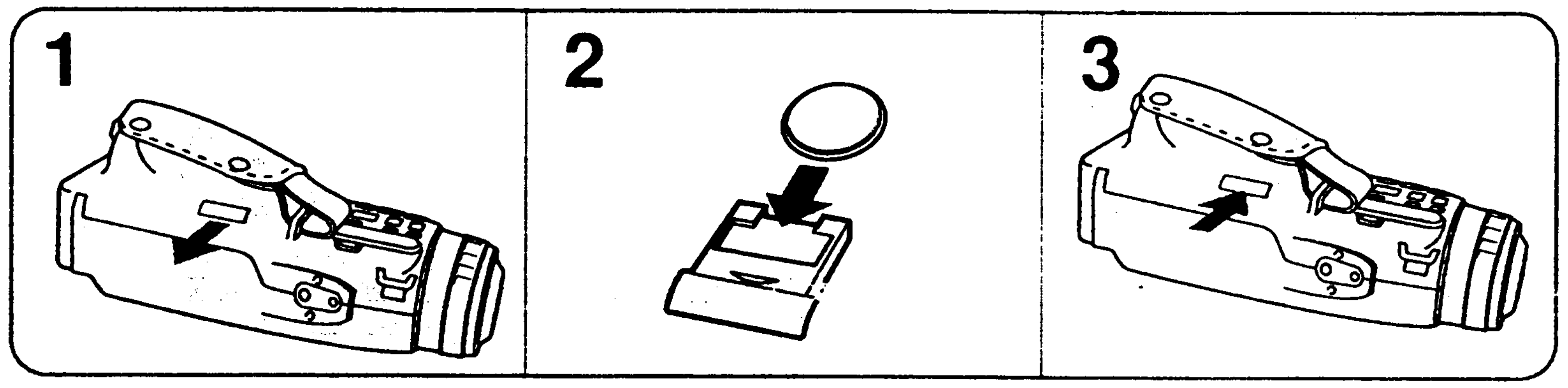
Installing the Lithium Battery

A lithium battery has positive and negative polarities.
Positive side of the battery is marked +. Negative side has no polarity sign.



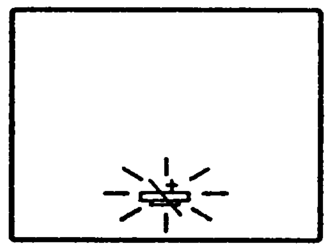
Installing the Lithium Battery

To activate the clock and store birth dates in the camcorder's memory, you must first install a lithium battery. (1) Remove the lithium battery holder located below the grip strap of the camcorder. (2) Install the supplied CR2025 lithium battery with the + side facing down. (3)Put the lithium battery holder into the camcorder.



Lithium Battery Life

The battery will last for approximately 1 year under normal conditions. When the lithium battery becomes weak, the ⊕ indicator will flash in the viewfinder for about 5 seconds when you turn STANDBY up while the POWER switch is set to CAMERA. In this case, **replace the battery with a Sony CR2025 or Duracell DL-2025. Use of any other battery may present a risk of fire or explosion.**



When replacing the lithium battery, keep the battery pack or other power source attached. Otherwise, input data will be cleared and you have to store the data again.

Warning

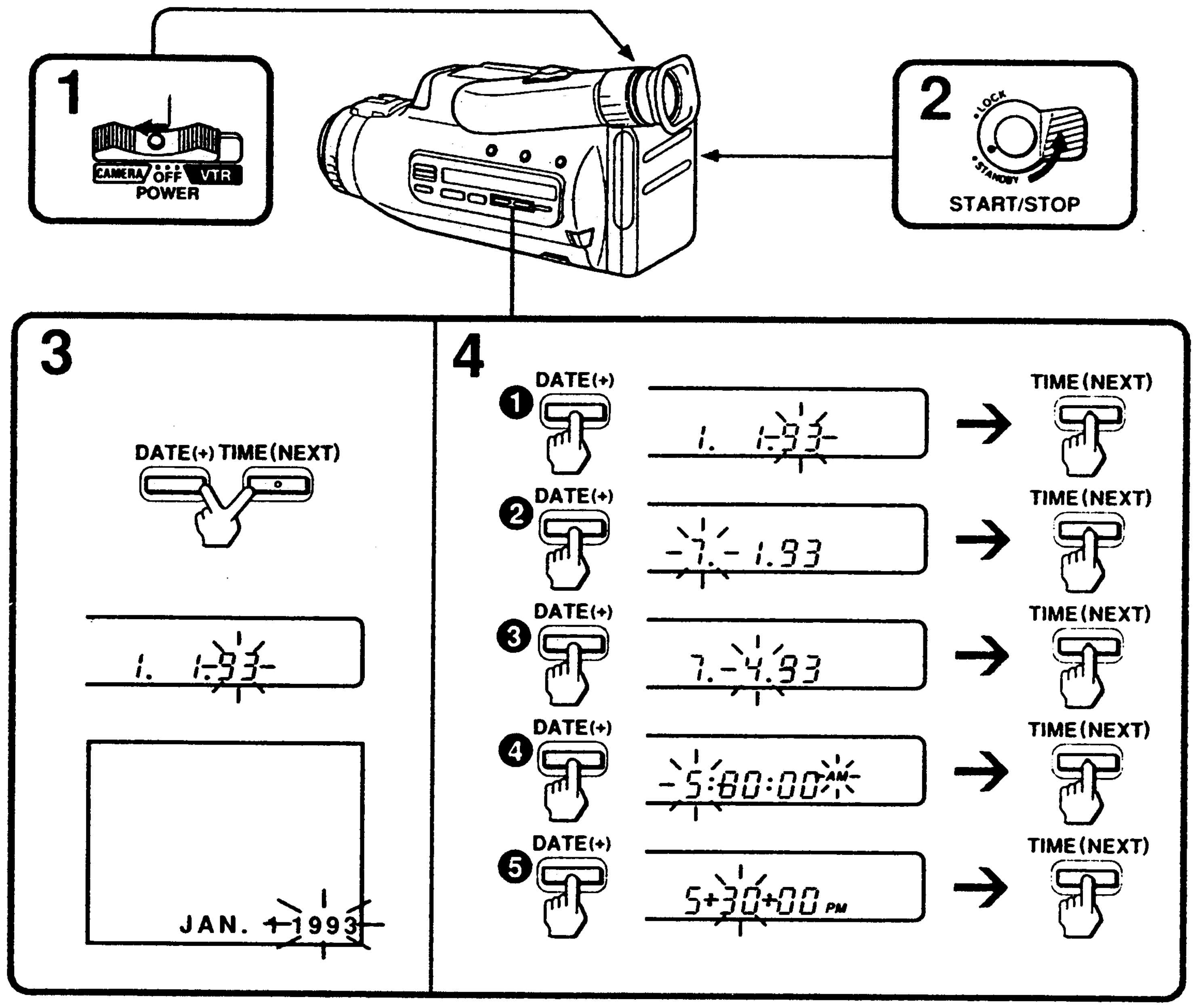
Battery may explode if mistreated. Do not recharge, disassemble or dispose of in fire.

Caution

Keep the lithium battery out of the reach of children. Should the battery be swallowed. consult a doctor immediately.

Setting the Date and Time

Before setting the clock, make sure a power source and lithium battery are installed. (1) While pressing the small green button on the POWER switch, slide the POWER switch to CAMERA. (2) Turn STANDBY up. (3) Press DATE (+) and TIME (NEXT) simultaneously for a few seconds until the year indicator flashes in the display window. (4) Adjust the flashing digits for the year, month, day, hour, and minute by using DATE (+) and TIME(NEXT). The clock starts from "00" second after you press TIME (NEXT) following the adjustment of the minutes. If you press TIME (NEXT) again, the time indicator will disappear.



To advance digits faster
Hold down DATE (+).

To correct the date and time setting
Repeat steps 3 to 4.

To check the preset date and time
Press DATE (+) to display the date indicator in the display window and in the viewfinder. Press TIME (NEXT) to display the time indicator. When you press the same button again, the indicator goes out, and, in the display window, the tape counter appears.

The year indicator changes as follows:

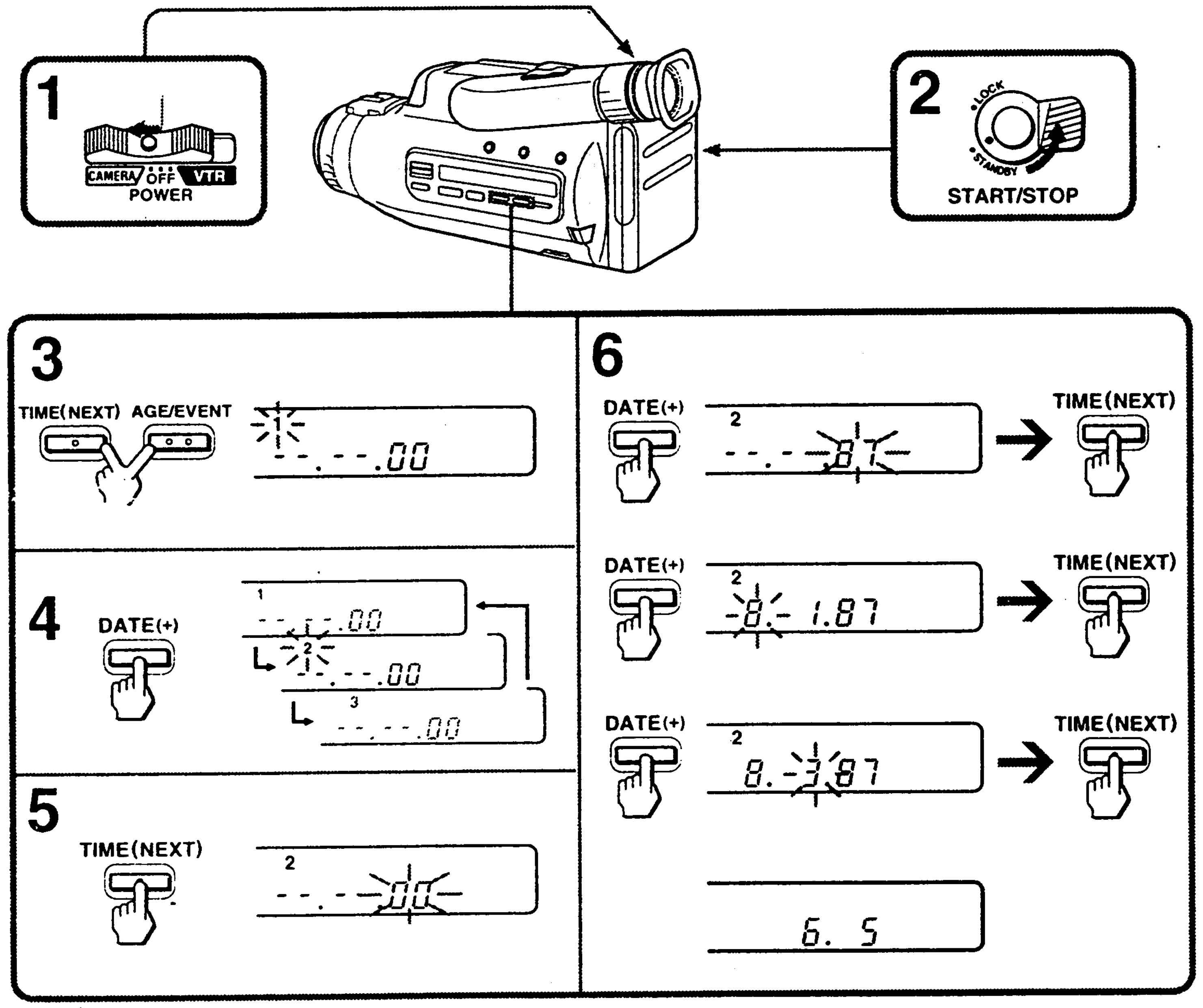
93 (1993) - - - →99 (1999) →00 (2000) - - - → 20 (2020)

Note on the time indicator
The internal clock of this camcorder operates on a 12-hour cycle.
12:00 AM stands for midnight. 12:00 PM stands for noon.

Storing a Birth Date in Your Camcorder

By presetting your child's birth date in your camcorder, you can record your child's age in years and months on your tape. Once you enter the birth date of your child, the camcorder's clock will automatically update the age of your child. You can preset up to three birth dates or events in the camcorder's memory.

Before storing a birth date, make sure a power source and the lithium battery are installed, and the date setting is correct. The following procedure stores "Aug. 3 1987" as an example in memory 2. (1) While pressing the small green button on the POWER switch, slide the POWER switch to CAMERA. (2) Turn STANDBY up. (3) Press TIME (NEXT) and AGE/EVENT simultaneously for a few seconds until the " 1--.-- .00" indicator appears in the display window. (4) Press DATE (+) to select memory 2. (5) Press TIME (NEXT). The "00" indicator flashes. (6) Enter the birth date by adjusting the flashing indicators for the year, month and day by using DATE (+) and TIME (NEXT).



To advance the digits faster
Hold down DATE (+).

Note on the birth or event date indicator
Each time you press DATE (+), the indicator in the display window changes from "1" to "2", "3" and comes back to "1".

In the viewfinder, the indicator changes as follows:

[1]BIRTHDAY→ [2]BIRTHDAY → [3]EVENT

To erase the Age Indicator in the Viewfinder
Press AGE/EVENT repeatedly until no indicator appears.

If You Missed the Currect Number with DATE (+)

The indicators in the display window change as follows:

year : "00" (1900) → "01" (1901) ---→ Current year
Current year minus 99

month : "1" → "2" ---→ "12"→ "- -"

day : "1" → "2"---→ "31"

To Correct and Change the Setting

Follow the procedures from step 3 on page 12 again.

To Preset the Year Before 1900

(1) After step 5 on page 12, hold down DATE (+) until the current year is displayed.
(2) Press DATE (+) again. The year goes back 99 years.
(3) Go to step 6 on page 12.

When in 2000

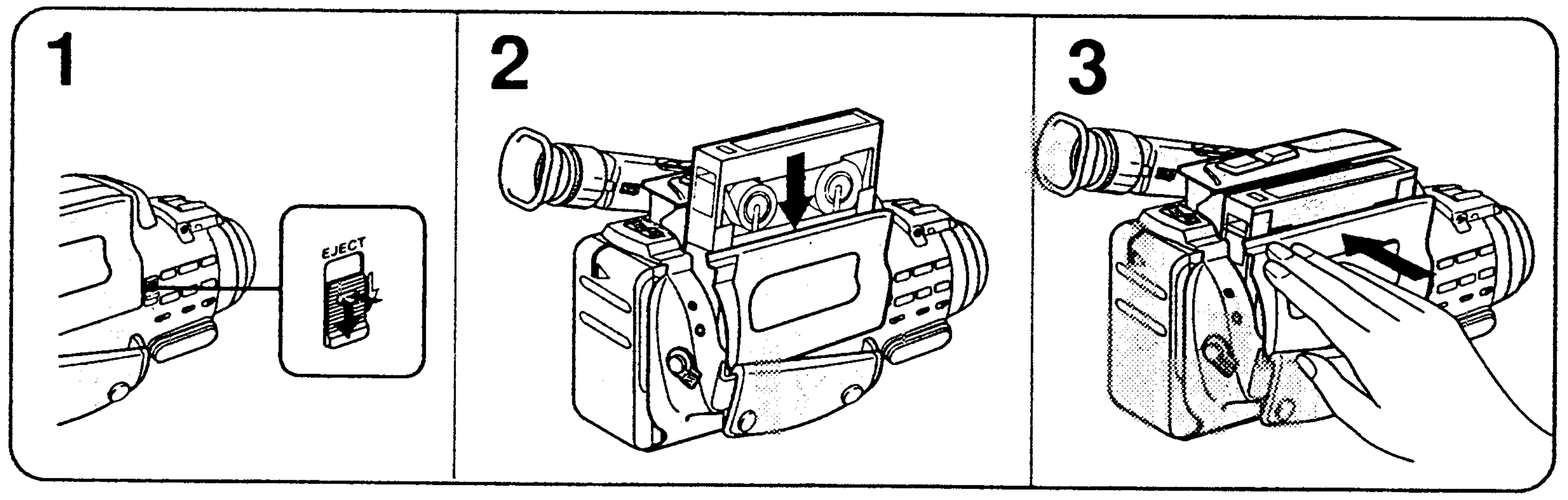
"--. --.01" is displayed in step 3 on page 12. After that, it advances every year as "02, 03, ...".

To Cancel the Stored Birth Date

(1) Press AGE/EVENT and TIME (NEXT) simultaneously to display "1" in the display window. Press DATE(+) to select a birth date to cancel.
(2) Press TIME (NEXT) twice. The month indicator flashes.
(3) Press DATE (+) repeatedly until "--.--." appears.
(4) Press TIME (NEXT). The time indicator flashes in the display window.
The selected birth date is canceled from the memory and is not displayed when you press AGE/EVENT.

Inserting a Cassette

Make sure a power source is attached. (1) While pressing the small blue button on EJECT, slide EJECT down. The cassette holder automatically moves up and opens. (2) Insert a cassette (not supplied) with the window facing out. (3) Press the PUSH mark on the cassette holder until it clicks to close it. The cassette holder will automatically slide down.

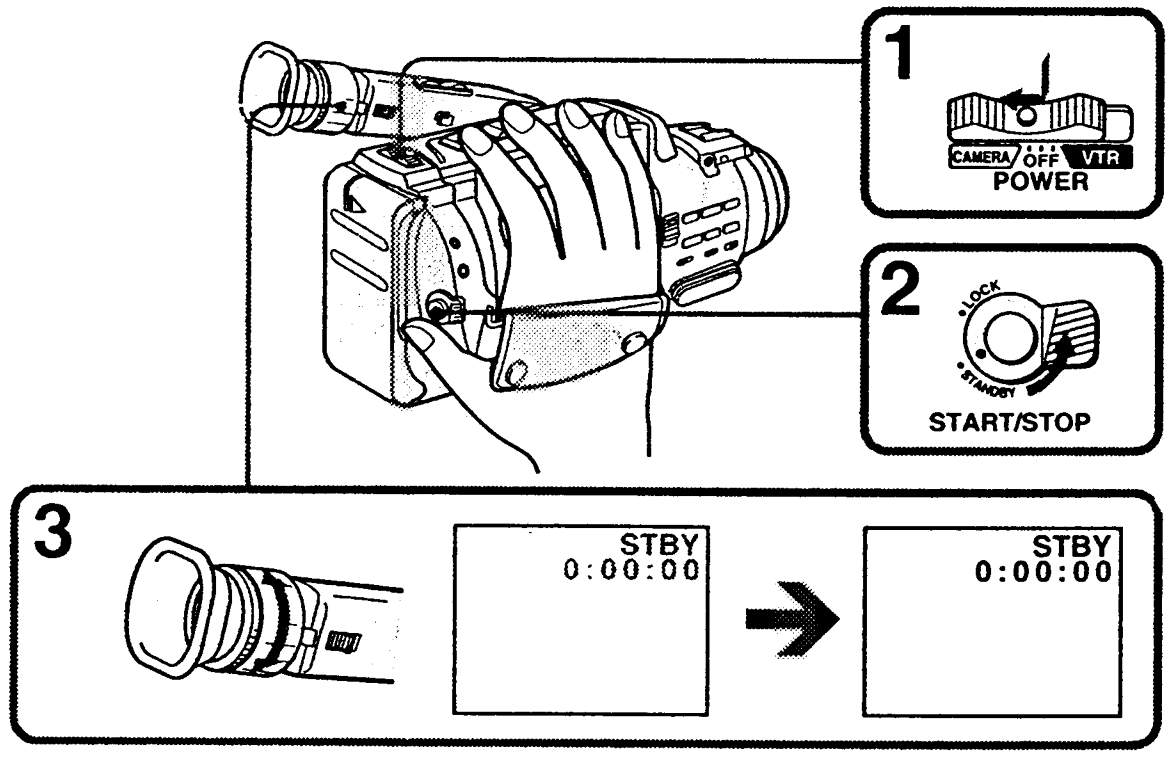


Ejecting the Cassette

While pressing the blue button on EJECT, slide EJECT down.

Adjusting the Viewfinder Lens

Before you use the camcorder for the first time, or after someone else has used it, focus the viewfinder lens. Make sure a power source is attached. (1) While pressing the small green button on the POWER switch, slide the POWER switch to CAMERA. (2) Turn STANDBY up. (3) Turn the viewfinder adjustment ring so that the indicators in the viewfinder come into sharp focus.

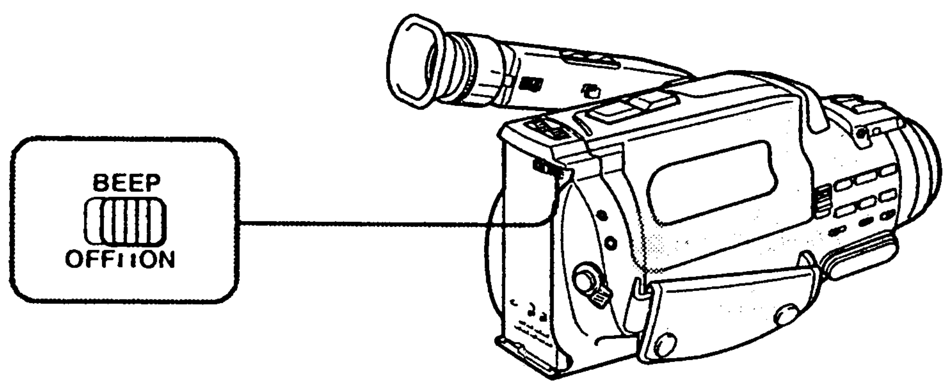


BEEP Feature

When you purchase the camcorder, BEEP is set to ON.
The camcorder will beep:

- Once when you start recording
- Twice when you stop recording
- Repeatedly when warning of unusual conditions (p.53)

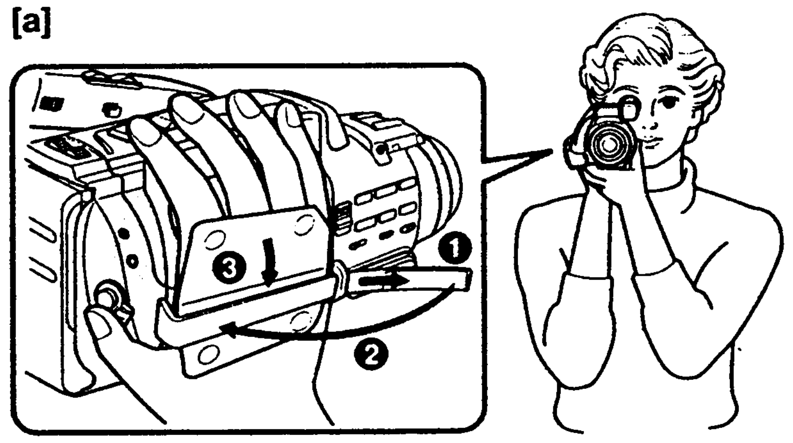
These beeps are not recorded on a tape. To deactivate the beep, detach the battery pack (p.7) to reach BEEP and set it to OFF.



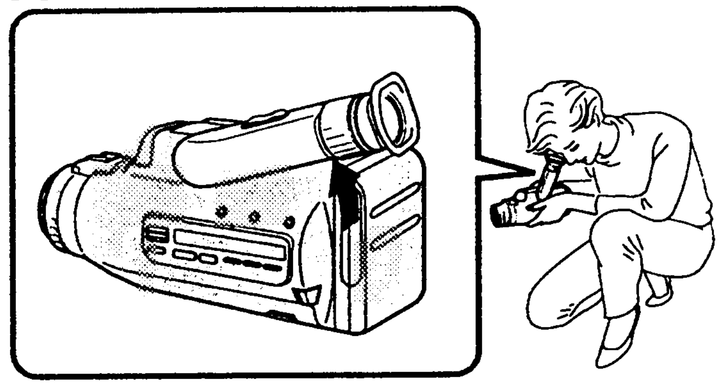
Hints for Better Shooting

For hand-held shots, you will get better result by holding the camcorder according to the following suggestions:

[a]



[b]



- Hold the camcorder firmly and secure it with the grip strap so that you can easily manipulate the controls with your thumb. **[a]**
- Place your right elbow against your side.
- Place your left hand under the camcorder to support it.
- Place the viewfinder eyecup firmly against your eye.
- Use the viewfinder frame as a guide to determine the horizontal plane.
- You can also record in a low position to get an interesting recording angle. Turn the viewfinder up for recording from a low position.(It can be turned up to 180 degrees.) **[b]**

Place the camcorder on a flat surface or use a tripod
Try placing the camcorder on a table or any other flat surface of suitable height. If you have a tripod for a still camera, you can also use it with the camcorder (p.47). Make sure the tripod screw is shorter than 6.5 mm (9/32 in).

Using the Viewfinder as a Sports Finder

What is a Sports Finder?

It is a function that enables you to monitor the picture while your eye is at a distance from the eyecup. It is convenient when moving around to shoot scenes.

Adjusting the Viewfinder Lens for the Sports Finder [c]

Turn the viewfinder adjustment ring clockwise completely.

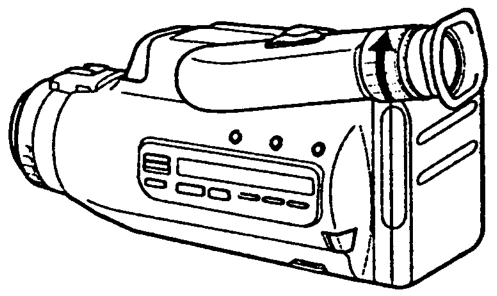
Returning to the Normal Viewfinder

Turn the viewfinder adjustment ring counterclockwise until indicators that appear in the viewfinder come into sharp focus when placing the eyecup against your eye.

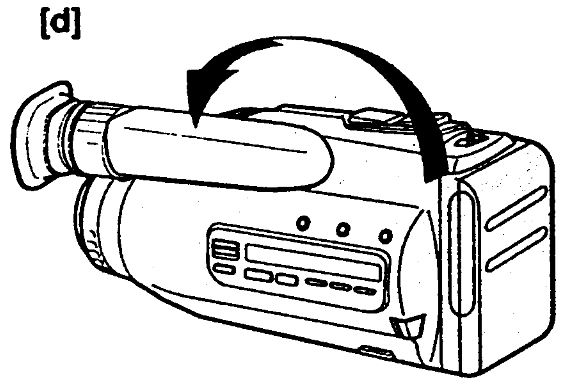
When Storing Your Camcorder [d]

Turn the viewfinder barrel to the front.

[c]



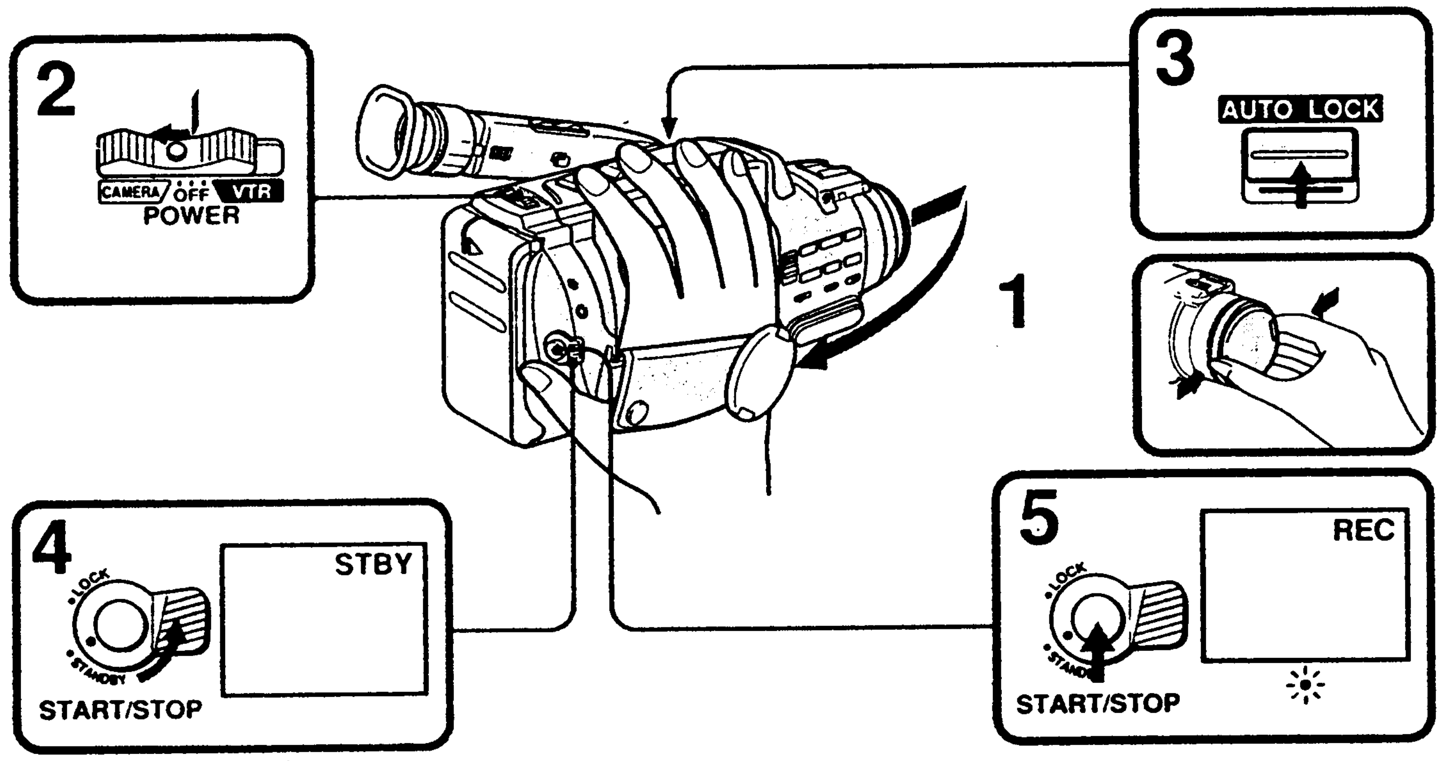
[d]



Basic Operations

Camera Recording

Make sure a power source is attached and a cassette is inserted. Before you record one-time events, you may want to make a trial recording to make sure you are using the camcorder correctly. (1) By pressing the releases on the lens cap, remove the lens cap and attach it to the grip belt. (2) While pressing the small green button on the POWER switch, slide the POWER switch to CAMERA. (3) Set AUTO LOCK to the green position. (A green bar appears under AUTO LOCK.) (4) Turn STANDBY up. (5) Press START/STOP (red button). The camcorder starts recording and the "REC" indicator appears and the red lamp lights in the viewfinder. The camera recording/battery lamp on the viewfinder barrel also lights.



To Stop Recording Momentarily

Press START/STOP again. The "STBY" indicator appears in the viewfinder (Standby mode).

To Finish Recording

Turn STANDBY down and slide the POWER switch to OFF.
Then eject the cassette (p. 14). To protect the lens attach the lens cap to the lens by pressing the releases on the cap .

Note on Standby mode
If you leave the camcorder for more than 5 minutes with a cassette inserted in Standby mode, the camcorder goes off automatically. This is to prevent the battery from being expended unnecessarily and is to protect the tape from wearing out. To resume Standby mode, turn STANDBY down once and up again. To start recording, press START/STOP

Note on recording
When you record from the beginning of the tape, run the tape for about 15 seconds before actual recording. This is to prevent the camcorder from missing any start-up scenes when you play back the cassette.

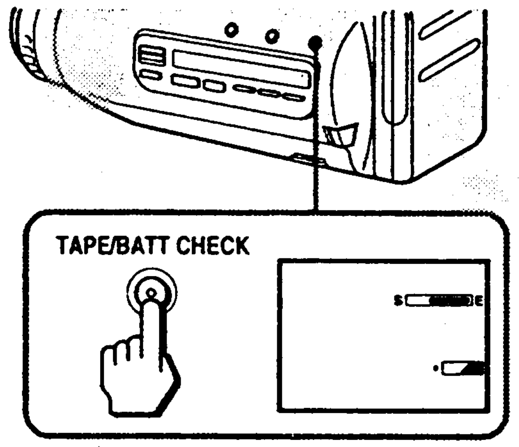
Note on the tape counter (P. 35)
The tape counter indicates the elapsed recording or playback time. Use it as a guide. There may be a discrepancy for several seconds from the actual time. To set the counter to zero, press COUNTER RESET above the display window.

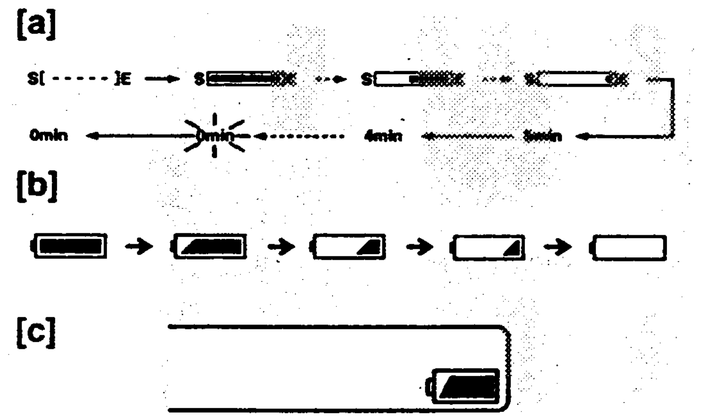
See next page for further information

To Check the Tape Remaining [a] or the Battery Capacity Remaining [b]

Press TAPE/BATT CHECK while recording, or in Standby or VTR mode. The S▬▬E indicator appears above in the viewfinder. "S" means Start. "E" means End. The black bar indicates the tape remaining. While the S[-----]E indicator appears the tape remaining is being caluculated. [a] The ▬ indicator appears below in the viewfinder. Black indicates battery capacity. [b]

The battery life indicator in the display window always shows the remaining battery capacity when the POWER switch is set to CAMERA or VTR with a power source attached. [c]





Notes on the tape remaining indicator

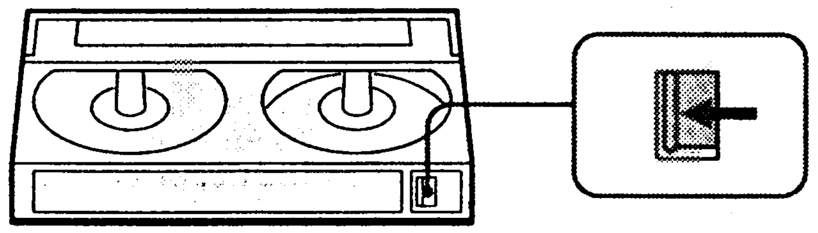
- The tape remaining indicator does not change while using EDITSEARCH, ▶▶, or ◀◀.
- In playback mode the indicator does not show the minutes remaining.

Notes on the battery capacity remaining indicator

- The battery capacity remaining indicator of the camcorder may indicate a different remaining capacity from that of the NP-77HD battery pack.
- Charge the battery pack when a low-capacity is indicated (p. 6).

To Prevent Accidental Erasure

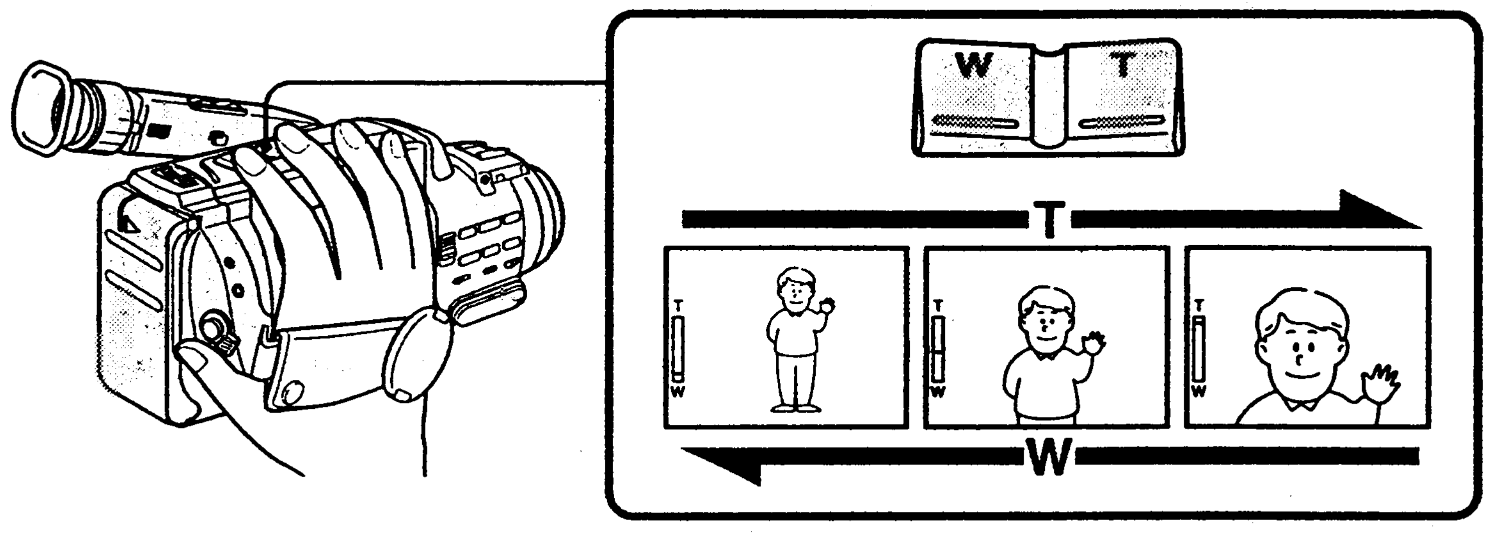
Slide the tab on the cassette to expose the red mark.



If you try to record with the red mark exposed, the ⊡ and ≜ indicators flash in the viewfinder and the display window, and you cannot record on the tape. To re-record on this tape, slide the tab back out to cover the red mark.

Using the Zoom Feature

Zooming is a recording technique that enables you to change the size of the subject in the scene. You can also use the zoom to focus manually or to decide on a shooting angle before you start recording. For more professional-looking recordings, use the zoom sparingly.
T side: for telephoto (subject appears closer)
W side: for wide-angle (subject appears farther away)



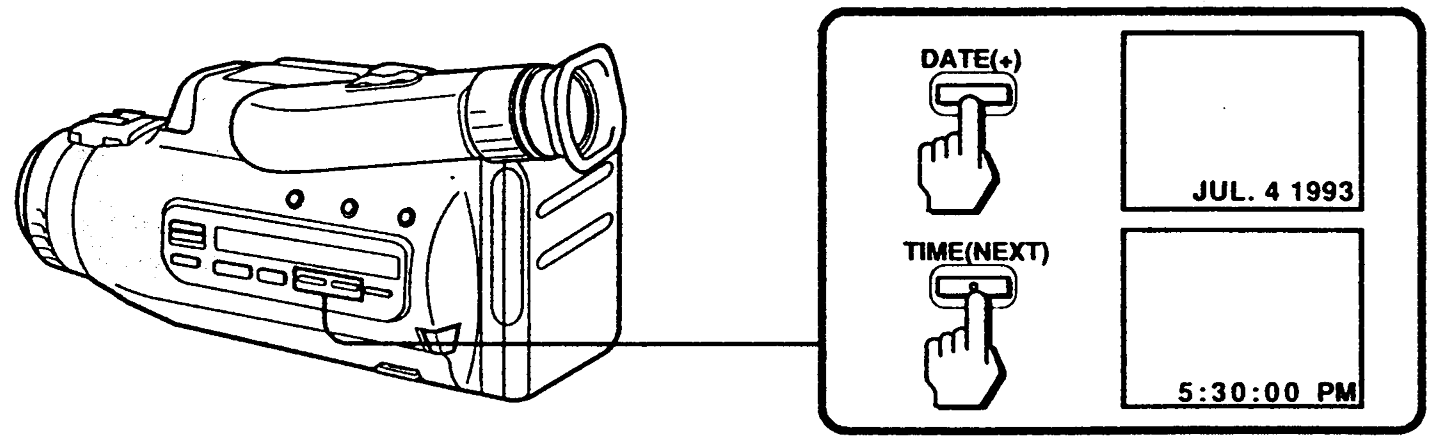
Zooming speed
Press the power zoom button firmly for high speed zooming. Press it softly for slow speed zooming.

When you shoot a subject using a telephoto zoom
If you cannot get a sharp focus while in extreme telephoto zoom, press the W side of the power zoom button until the focus is sharp. You can shoot a subject that is at least 1.2 m (about 47¼ inches) away from the lens surface in the telephoto position, or 1 cm (about 1/2 inches) in the wide-angle position.

Manual focusing in macro
You can also shoot with manual focus while doing close-ups (p. 30).

Recording the Date or Time

You can record the date or time displayed in the viewfinder with the scene while making a camera recording (p. 17). Make sure the date is set (p. 12). Set the POWER switch to CAMERA. Turn STANDBY up. Press DATE (+) or TIME (NEXT). The date or time indicator appears in the screen. You cannot record the date and time at the same time. Except for the date, time or age (p. 20) indicators, no indicators in the viewfinder are recorded.

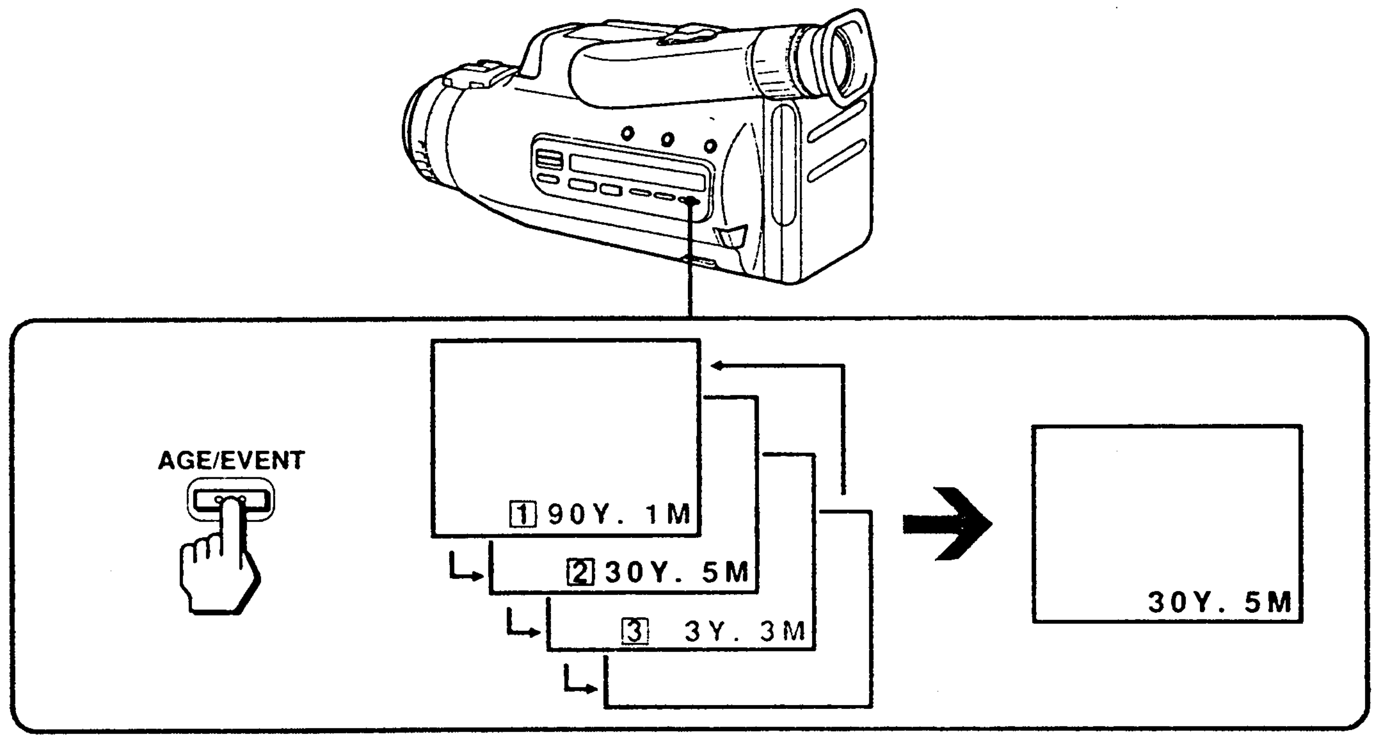


To Stop Recording the Date or Time

Press DATE (+) or TIME (NEXT) whichever the indicator is in the screen again. The camera recording does not stop if you cancel recording the date or time.

Recording an Age

You can record the age displayed in the viewfinder with the scene while making a camera recording (p. 17). Make sure the date is preset (p. 11). After setting the POWER switch to CAMERA and turning STANDBY up, press AGE/EVENT to select the $\boxed{1}$, $\boxed{2}$, or $\boxed{3}$ you can record the time elapsed since the date set, for example, your child's birthday. You can also check the age in the display window. Except for the age, date or time (p. 19) indicators, no indicators are recorded.



Note on the age indicator
Each time you press AGE/EVENT, the indicator changes from $\boxed{1}$ "The first age" to $\boxed{2}$ "The second age", $\boxed{3}$ "The third age" and back to no indicator. No-preset item will be skipped. The $\boxed{1}$, $\boxed{2}$, or $\boxed{3}$ indicator goes out after one second.

To Stop Recording the Age

Press AGE/EVENT repeatedly until the indicator goes out.

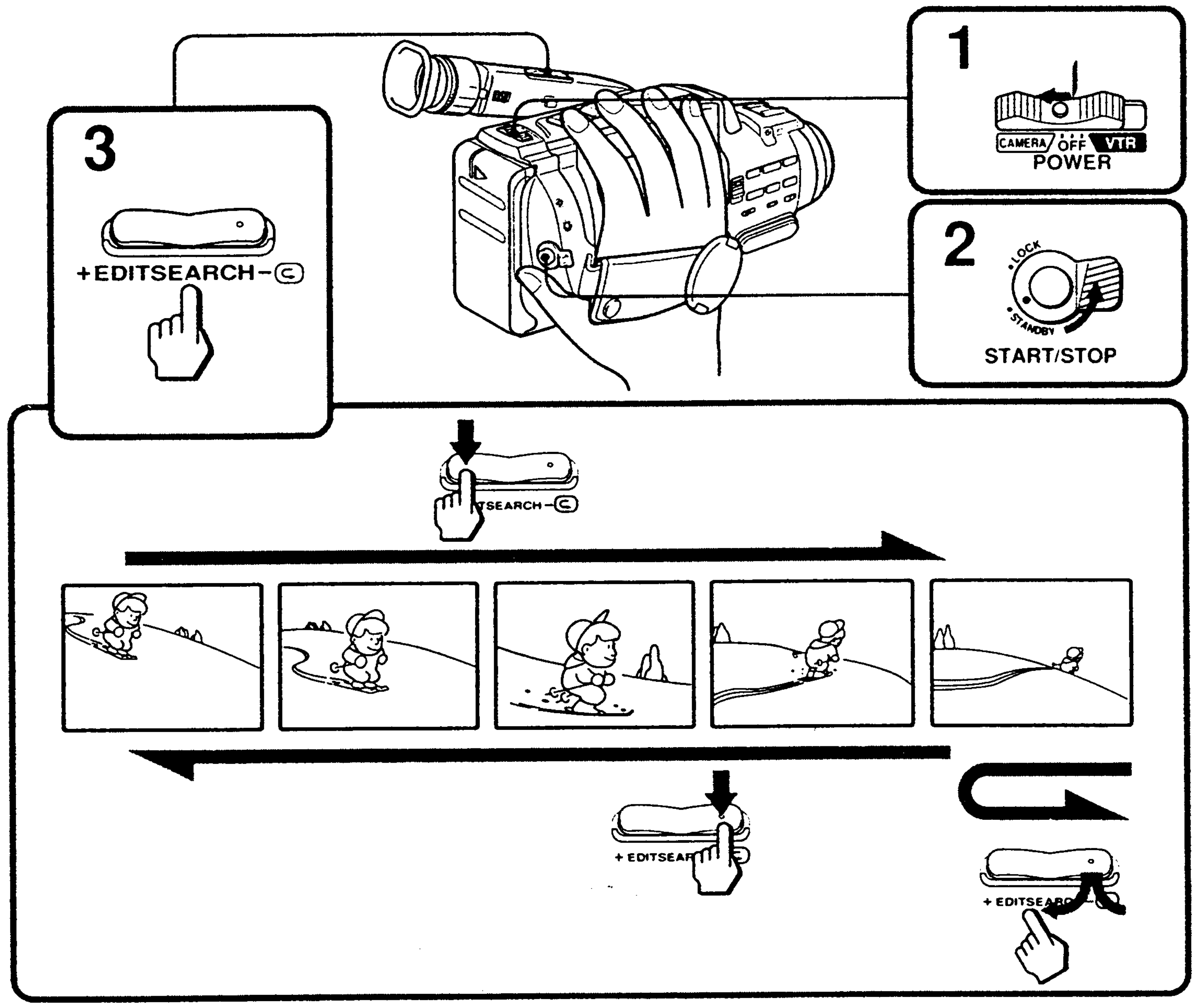
To Select or Change an Age in the Memory to Record While Recording

Press AGE/EVENT repeatedly until the indicator you want to record appears. Recording of the indicator you select starts after $\boxed{1}$, $\boxed{2}$, or $\boxed{3}$ indicator goes out.

When the camcorder is connected to a TV
The age indicator will appear on the TV screen when the $\boxed{1}$, $\boxed{2}$, or $\boxed{3}$ indicator goes out from the viewfinder. It appears even if the data-screen function controlled by the Remoto Commander is off (p. 49).

Checking the Recorded Picture in the Viewfinder

Using EDITSEARCH, you can review the last recorded scene and check the recorded picture in the viewfinder. (1) While pressing the small green button on the POWER switch, slide the POWER switch to CAMERA. (2) Turn STANDBY up. (3) Press the – ⊜ side of EDITSEARCH momentarily, you can view the last few seconds of the recorded portion (**Rec Review**). Keep pressing EDITSEARCH. You can view the recorded portion (**Edit Search**). To stop playback, release EDITSEARCH.
+ side: to view the playback picture forward
– side: to view the playback picture in reverse



Note on using EDITSEARCH
When you raise the viewfinder and use EDITSEARCH, hold the viewfinder with your thumb to prevent movement.

Monitoring the Sound While Viewing the Playback Picture in the Viewfinder

Connect an headphone (not supplied) to the ∩ jack. Play back the tape in VTR mode (p. 25).

To Begin Re-recording

Press START/STOP. Re-recording begins from the point you released EDITSEARCH. Provided you do not eject the tape, the transition between the last scene you recorded and the next scene you record will be smooth.

Connections for Playback

You can use this camcorder as a VCR by connecting it to your TV for playback. There are three ways to connect your camcorder to a TV.

- Connecting by using the AC connecting adaptor
- Connecting directly by using A/V connecting cable
- Connecting directly without A/V connecting cable

We recommend you to use house current for indoor use of the camcorder (p. 27).

Connecting to a TV or VCR Using the Connecting Adaptor

Use the supplied connecting adaptor and AC-V25S AC Power Adaptor.

Preparing the Connecting Adaptor

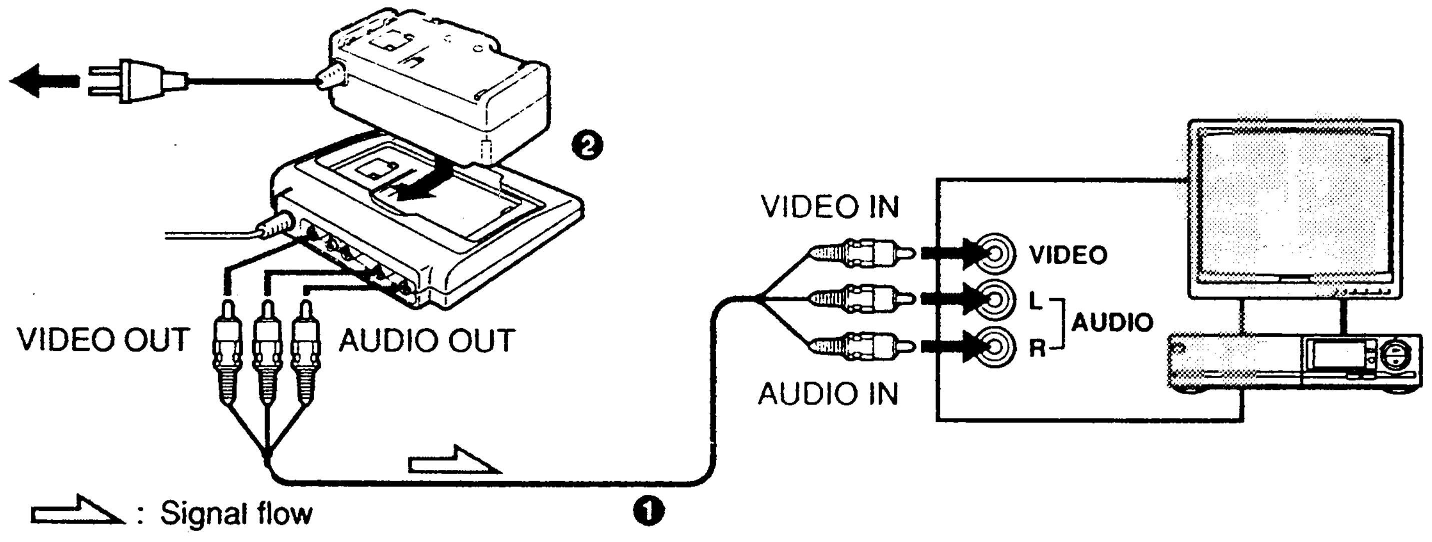
It is convenient connecting the connecting adaptor and your TV previously. Whenever you want to monitor the picture from the camcorder, you can do it by just connecting the camcorder and the connecting plate of the connecting adaptor.

Note on the connecting adaptor

A battery pack can not be attached to the connecting adaptor.

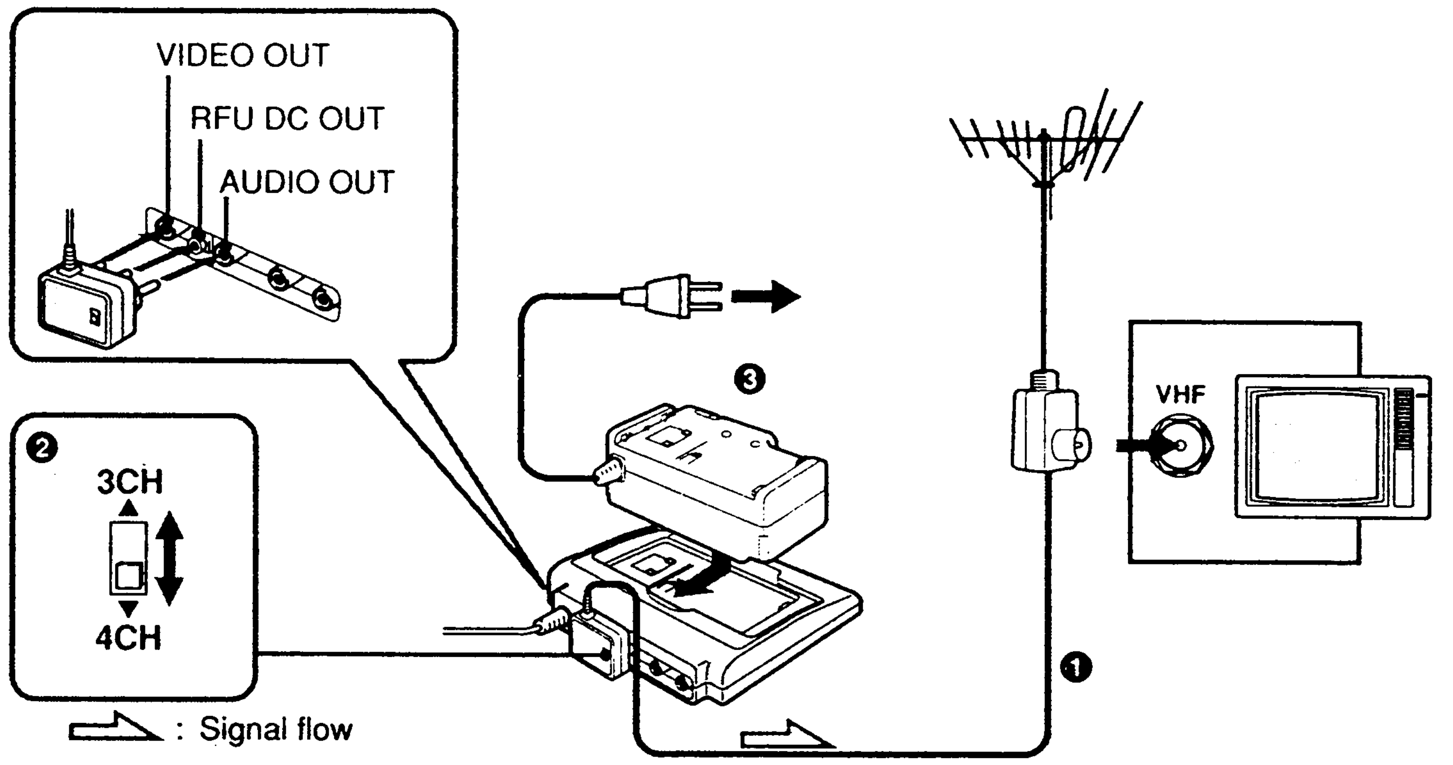
If your TV or VCR has audio/video input jacks

If your TV or VCR is a stereo type use the supplied A/V connecting cable. If your TV or VCR is a monaural type use a VMC-910MS/920MS A/V Connecting Cable (not supplied). (1) Connect your TV or VCR and the connecting adaptor with the A/V connecting cable. (2) Put the AC power adaptor on the connecting adaptor and while pressing the AC power adaptor, slide it in the direction of the arrow. Connect the power cord of the AC power adaptor to a wall outlet.



If your TV does not have audio/video input jacks

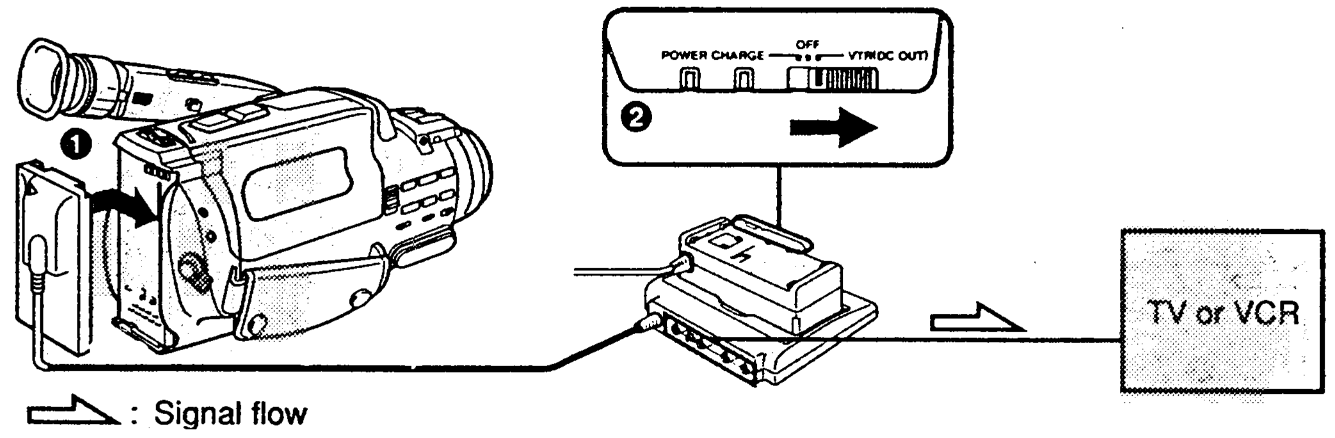
(1) Connect your TV and the connecting adaptor by using supplied RFU-90UC RFU Adaptor. (2) Set the channel selector of the RFU adaptor to 3CH or 4CH whichever is not active in your area. (3) Put the AC power adaptor on the connecting adaptor and while pressing the AC power adaptor, slide it in the direction of the arrow. Connect the power cord of AC power adaptor to a wall outlet.



The playback sound is monaural when you use the RFU adaptor.

Connect the Camcorder and the Connecting Plate

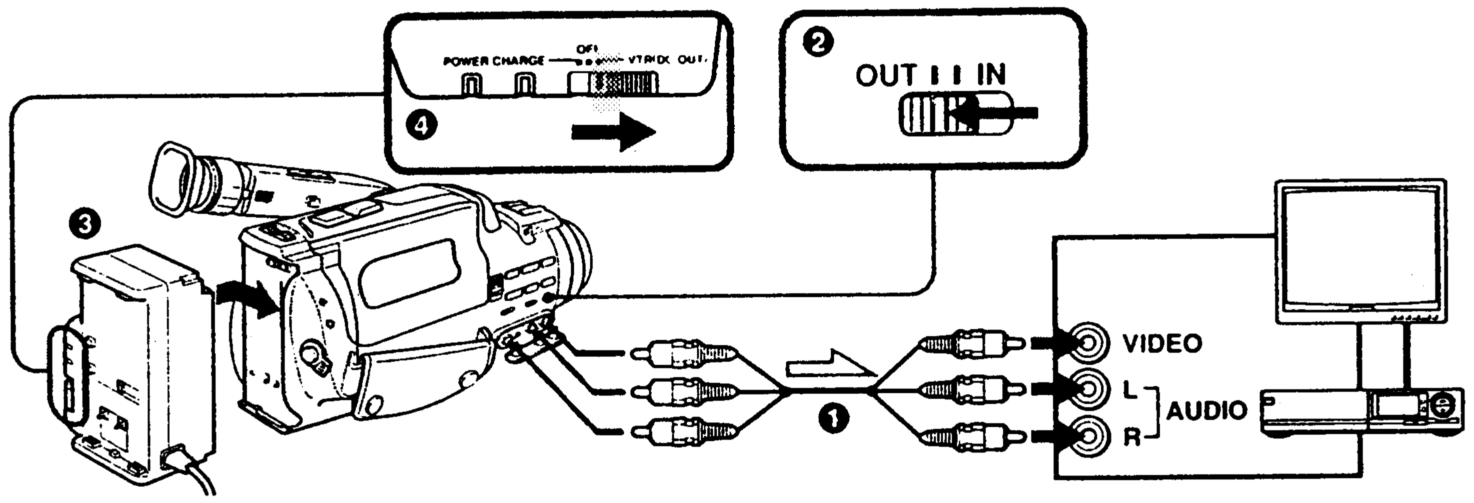
(1) Align the right side of the connecting plate of the connecting adaptor to a white line on the camcorder. And while pressing the connecting plate slide it in the direction of the arrow. (2) Set the VTR (DC OUT)/CHARGE selector on the AC power adaptor to VTR (DC OUT).



Connections for Playback

Connecting to a TV or VCR Directly with A/V Connecting Cable

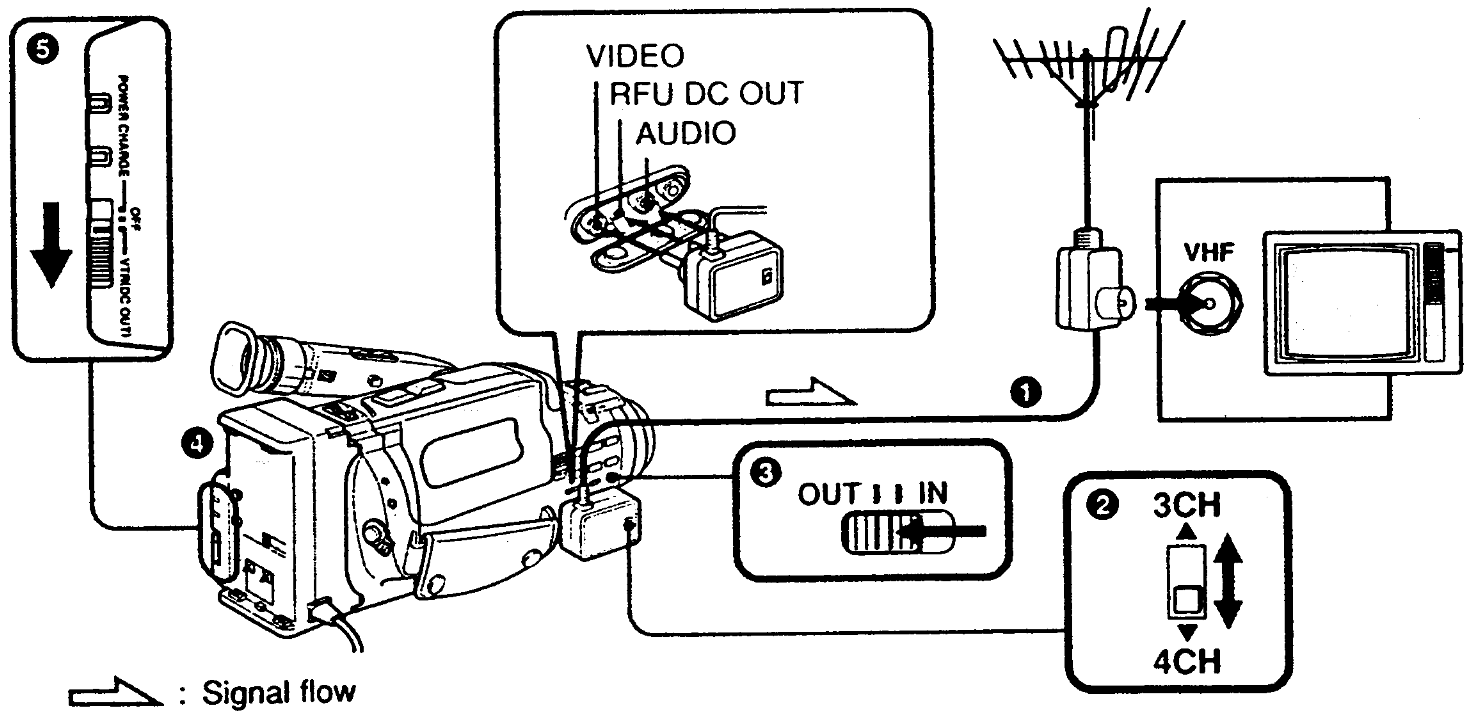
If your TV or VCR is a stereo type use the supplied A/V connecting cable. If your TV or VCR is a monaural type use a VMC-910MS/920MS A/V Connecting Cable (not supplied). (1) Connect the camcorder and your TV or VCR with the A/V connecting cable. (2) Set IN/OUT on the camcorder to OUT. (3) Align the right side of the AC power adaptor with a white line on the camcorder and while pressing the AC power adaptor, slide it in the direction of the arrow. (4) Set the VTR (DC OUT)/CHARGE selector of the AC power adaptor to VTR (DC OUT).



: Signal flow

Connecting to a TV Directly without A/V Connecting Cable

(1) Connect the camcorder and the TV by using the supplied RFU adaptor. (2) Set the channel selector on the RFU adaptor to 3CH or 4CH whichever is not active in your area. (3) Set IN/OUT of the camcorder to OUT. (4) Align the right side of the AC power adaptor with a white line on the camcorder and while pressing it, slide it in the direction of the arrow. (5) Set the VTR (DC OUT)/CHARGE selector of the AC power adaptor to VTR (DC OUT).



: Signal flow

The playback sound is monaural when you use the RFU adaptor.

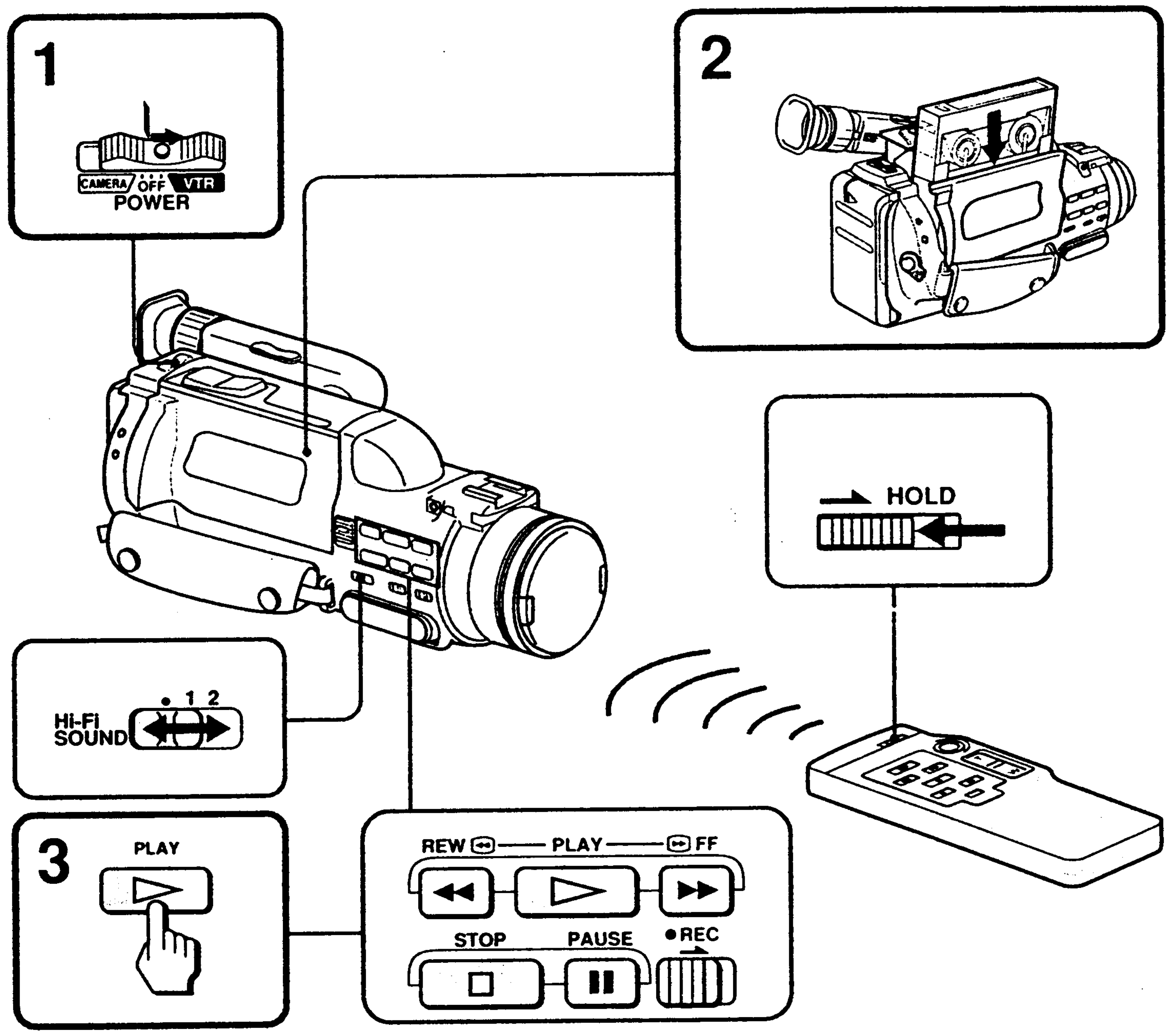
When you view a TV program

Set the VTR (DC OUT)/CHARGE selector of the AC power adaptor to OFF or set the POWER switch of the camcorder to OFF.

Playing Back a Tape

You can monitor the playback picture in the viewfinder. You can also monitor it on a TV screen after connecting the camcorder to a TV/VCR (p. 22). You can use the Remote Commander to remotely operate the camcorder. If HOLD on the commander is set to the right, slide it in the opposite direction.

(1) While pressing the small green button on the POWER switch, set the POWER switch to VTR. (2) Insert a recorded cassette with the window facing out (p.14). (3) Press ▷. Playback starts.



To stop playback, press □.
To rewind the tape, press ◀◀.
To advance the tape rapidly, press ▶▶.

Note on the recording/playback modes

You can record a tape in SP (standard play) mode only. You can play back tapes in both SP and LP (long play) modes.

The LP indicator appears in the viewfinder when you play back a tape recorded in LP mode. There is no SP/LP indicator in SP mode.

See next page for further information

Various Playback Modes

To View a Still Picture (Playback Pause)

Press II during playback. To resume playback, press II or ▷.

To Locate a Scene (Picture Search)

Keep pressing ◀◀ or ▶▶ during playback. To resume normal playback, release the button.

To Monitor the High-speed Picture During Fast-forward or Rewind (Skip Scan)

Keep pressing ◀◀ while rewinding, or ▶▶ while advancing the tape. To resume normal playback, press ▷.

To View the Picture in a Sequence of Stop-motion Images

Press EDITSEARCH repeatedly in playback pause mode. If you keep pressing EDITSEARCH, you can view the playback picture forward (+) or reverse (–).

To View the Picture at 1/5 Speed (Slow Playback) (only with the Commander)

Press I▶ on the commander during playback. To resume normal playback, press ▷. When slow playback lasts for about 1 minute, it shifts to the normal speed starts automatically.

Notes on playback

- Streaks may appear and the sound may be muted depending on playback mode.
- When still picture mode lasts for about 5 minutes. the camcorder automatically enters stops.

To display the viewfinder screen indicators on a TV

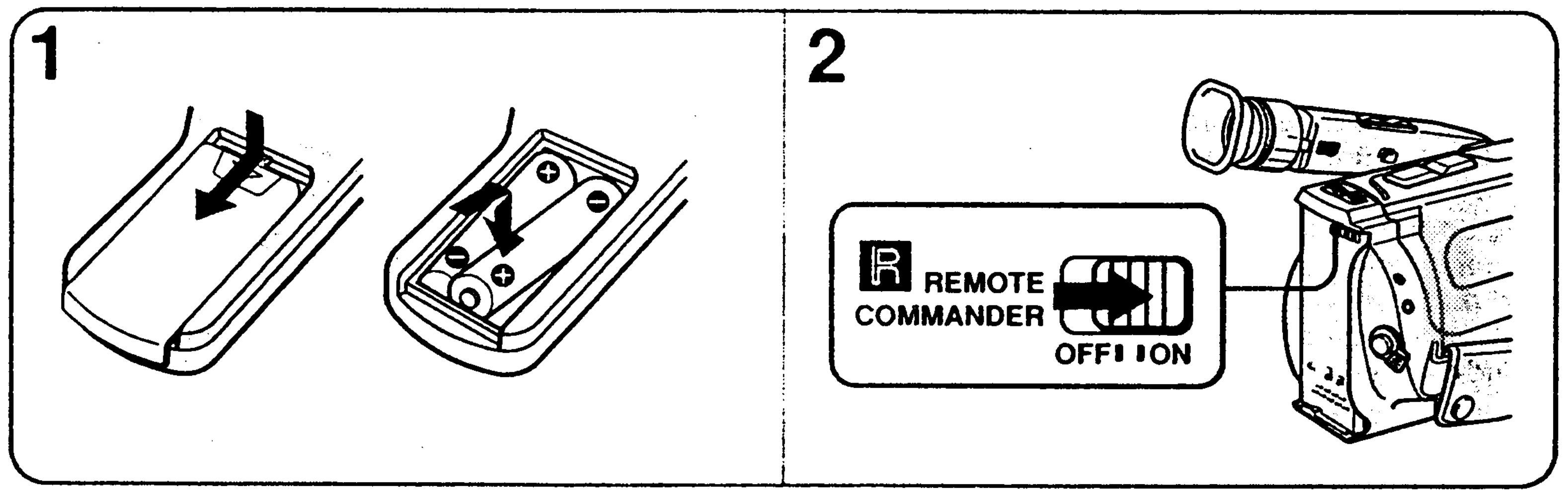
Press DATA SCREEN on the Remote Commander.
To erase the indicators, press DATA SCREEN again.

Playing Back a Tape with Dual Sound Tracks

- Normally set the Hi-Fi SOUND switch to the ● position.
- When the tape with dual sound tracks is played back, set the Hi-Fi SOUND switch to the desired sound, 1 or 2.
- When you connect to a TV using the RFU adaptor or when the TV or VCR is a monaural type, set the Hi-Fi SOUND switch to 1 or 2.

Preparing the Remote Commander

To use the supplied Remote Commander for playback and camera recording, do the following: (1) Insert supplied two size AA (R6) batteries with correct polarity. (2) Set R REMOTE COMMANDER on the battery mounting surface of the camcorder to ON.



Notes on the Remote Commander

- Keep the remote sensor away from strong light such as direct sunlight or illumination. Remote control with the Remote Commander may not be effective.
- The command mode of the Remote Commander is VTR2. Avoid using the Sony VCRs with the same command mode at the same time.

Using Alternative Power Sources

You can choose any of the following power sources for your camcorder: Battery pack (p. 6), house current, and 12/24 V car battery.
The appropriate power source for you to choose depends on the place where you want to use your camcorder.

Place	Power source	Accessory to be used
Outdoors	Battery pack	Battery pack NP-55 (supplied), NP-77H/77HD, NP-77, NP-66H or NP-55H
Indoors	House current	AC power adaptor AC-V25S (supplied), or AC-S10
In the car	12 V or 24 V car battery	DC pack DCP-77

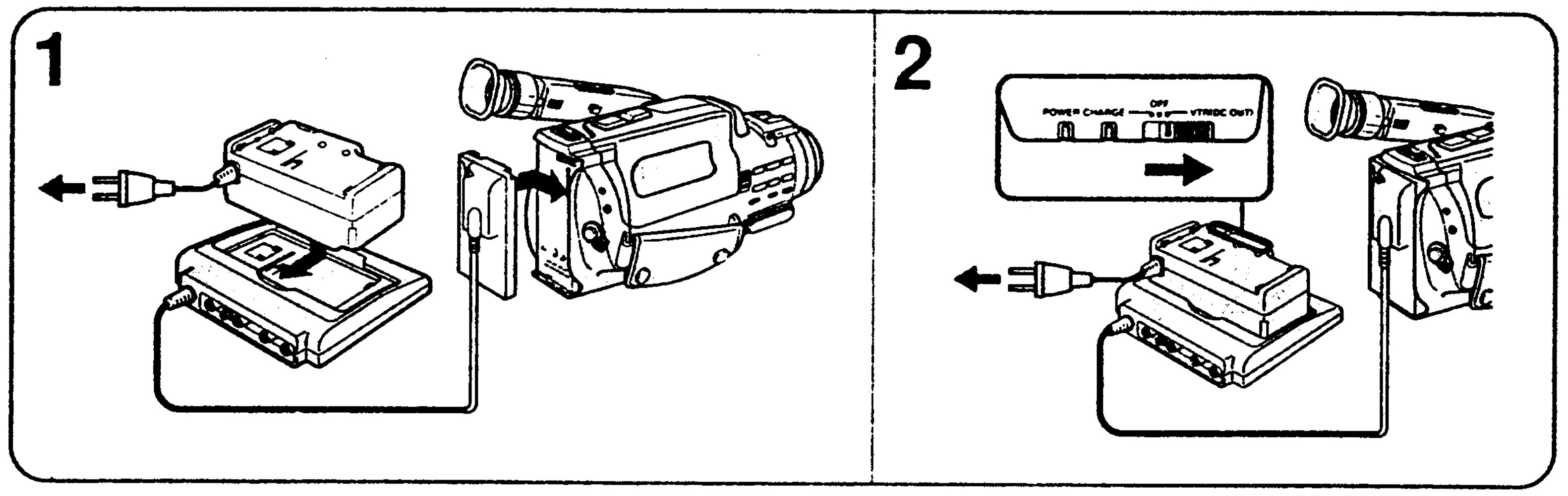
Note on power sources

Disconnecting the power source or detaching the battery pack during recording or playback may damage the inserted tape. If this happens, supply the power again immediately.

Using House Current

With the Connecting Adaptor

Use the supplied AC-V25S AC Power Adaptor and connecting adaptor.
(1) Attach the connecting plate of the connecting adaptor to the camcorder (p.22). Attach the AC power adaptor to the connecting adaptor (p.22). And connect the power code of the AC power adaptor to a wall outlet. (2) Set the VTR (DC OUT)/CHARGE selector on the AC power adaptor to VTR (DC OUT).

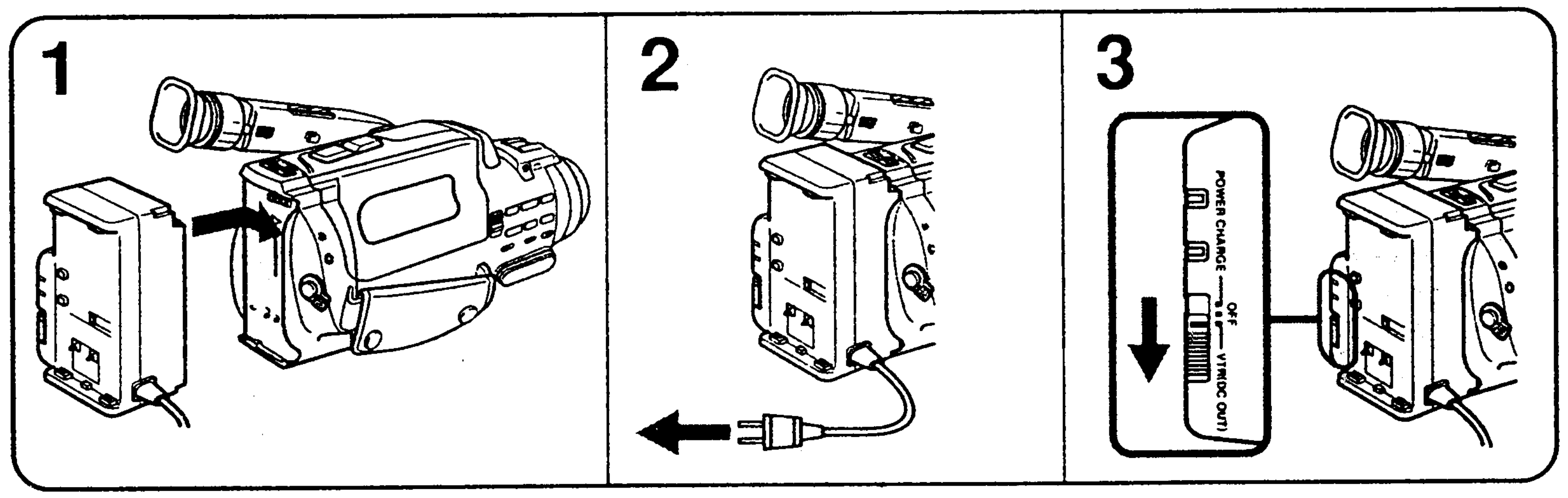


See next page for further information

Using Alternative Power Sources

Without the Connecting Adaptor

Use the supplied AC-V25S AC Power Adaptor. (1) Align the flat side of the AC power adaptor with the white line on the camcorder. While pressing the AC power adaptor, slide it to the right until it clicks. (2) Connect the power cord of the AC power adaptor to a wall outlet. (3) Set the VTR (DC OUT)/CHARGE selector on the AC power adaptor to VTR (DC OUT).



To detach the AC power adaptor
Datach it in the same way you do it with the battery pack (p. 7).

Notes on the AC power adaptor

- Before attaching the AC power adaptor to the camcorder, detach the battery pack from the AC power adaptor.
- The camcorder does not operate unless the VTR (DC OUT)/CHARGE selector is set to VTR (DC OUT).
- The POWER lamp will remain lit for a while even if the battry pack is detached and the power cord is disconnected after charging the battry. This is normal.
- If the power lamp does not light, set the VTR (DC OUT)/CHARGE selector to OFF and disconnect the power cord. In about one minute, reconnect the power cord and set the VTR (DC OUT)/CHARGE selector to VTR (DC OUT) again.

Using a Car Battery

When you want to use a car battery as a power source for your camcorder, use the DCP-77 DC Pack (not supplied). By attaching DCP-77 DC Pack to your camcorder and connecting the power cord of the DC pack to the cigarette lighter socket of a car (12 V or 24 V), the car battery supplies power to your camcorder.

To detach the DC pack from the camcorder
Detach it the same way you do the battery pack (P. 7).

Options for Charging Battery

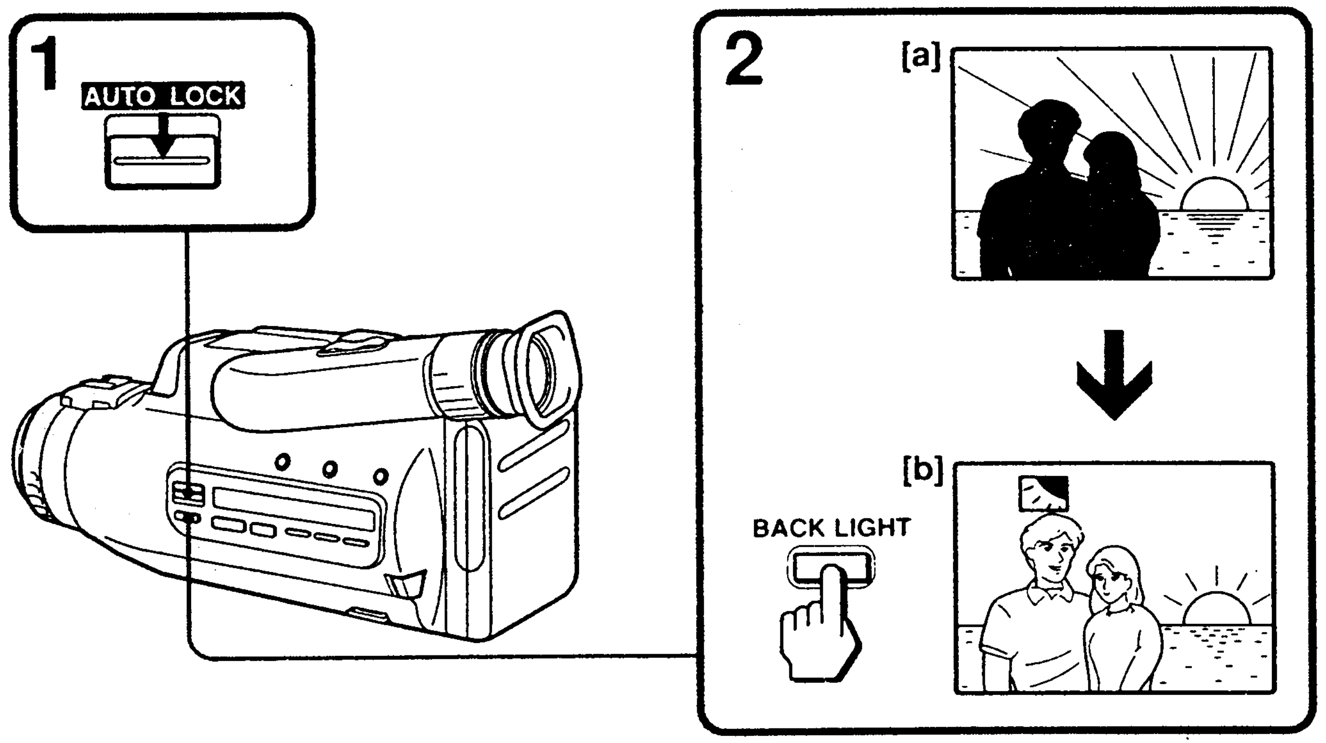
AC-S10 AC Power Adaptor
Completely discharge a battery pack before recharging it to its full capacity.

BC-77, BC-S10 Portable Battery Charger
Charge a battery pack on 100 – 240 V AC. BC-S10 has a discharging function.

DC-S10 Car Battery Charger
Charge a battery pack through the cigarette lighter socket. It has a discharging function.

Compensating for Backlighting

When shooting a subject that is rather dark because the light source is behind the subject [a] you can compensate for the brightness for the subject. (1) Slide AUTO LOCK down. (2) Press BACK LIGHT. The ▣ indicator appears in the viewfinder. [b]



[a] Subject is too dark because of backlight.
[b] Subject becomes bright with backlight compensation.

After shooting
Be sure to release this adjustment condition by pressing BACK LIGHT again. The ▣ indicator in the viewfinder goes out. Otherwise, the picture will be too bright under normal lighting condition.

This function is also effective under following conditions:

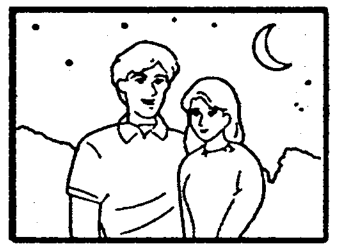
- On the snow e.g. at the ski resort
- At the beach under strong sunshine
- A subject with a light source nearby or a mirror reflecting light
- A white subject against a white background. Especially when you shoot a person wearing shiny clothes made of silk or synthetic fiber, his or her face tends to become dark if you do not use this function.

Focusing Manually

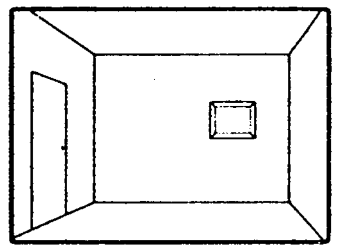
When to Use Manual Focus

Use manual focus under the following conditions:

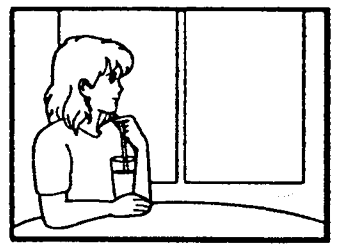
[a]



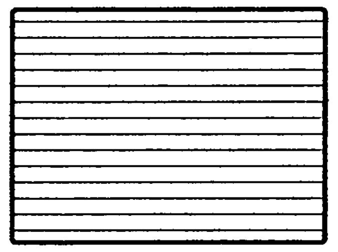
[b]



[c]



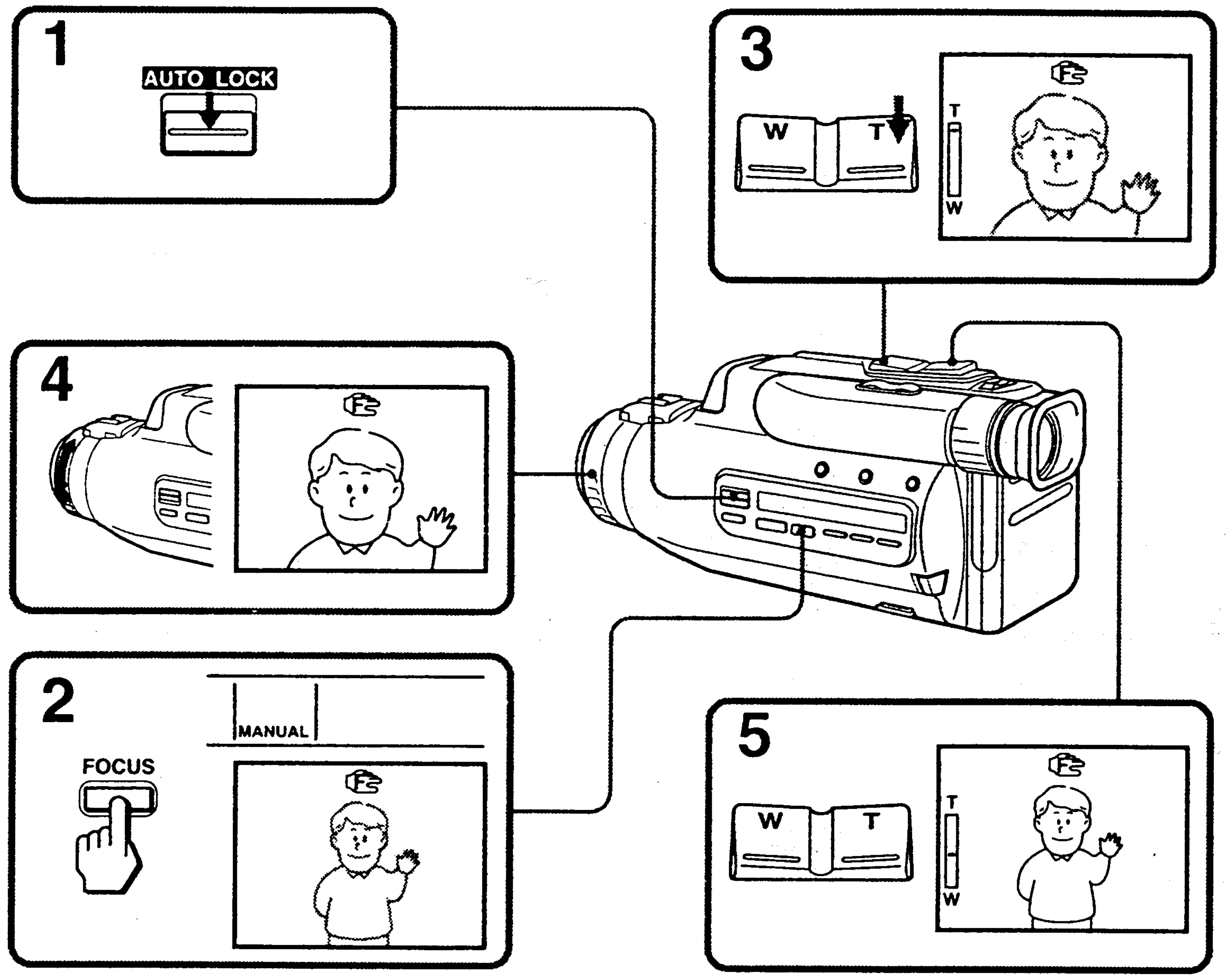
[d]



- Insufficient light **[a]**
- Subjects with little contrast - walls, sky, etc. **[b]**
- Too much brightness behind the subject **[c]**
- Horizontal stripes **[d]**
- Subjects through frosted glass
- Subjects beyond nets, etc.
- Bright subject or subject reflecting light
- Shooting a stationary subject when using a tripod

Focusing Manually

When focusing manually, first focus in telephoto before recording, and then reset the shot length. (1) Slide AUTO LOCK down. (2) Press FOCUS. The ☞ indicator appears in the viewfinder and "MANUAL" appears in the display window. (3) Keep pressing the T side (telephoto) of the power zoom button until the zooming stops. (4) Turn the focus ring to achieve sharp focus. (5) Set the desired shot length using the power zoom button.



To Shoot with Autofocus

Press FOCUS. The "AUTO" appears in the display window and ☞ indicator disappears in the viewfinder.

To return to Autofocus mode

Slide AUTO LOCK up. The ☞ indicator in the viewfinder disappears.

To shoot in relatively dark places
Shoot at wide angles after focusing in telephoto.

Note on the focus ring
The focus ring does not have a stop position.

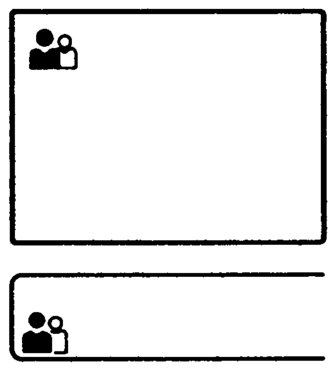
Using the PROGRAM AE Function

You can select the suitable mode among three PROGRAM AE (Auto Exposure) modes depending on shooting situations. When you use PROGRAM AE. you can get a Portrait effect (the subject is in focus and the background is out of focus) or capture high-speed action with Sports mode or High-Speed Shutter mode.

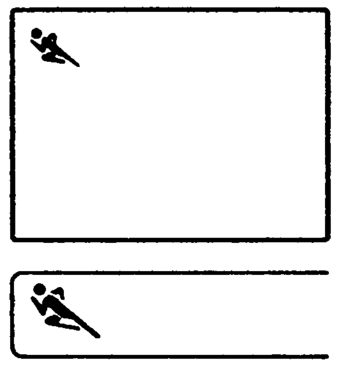
Selecting the Best Mode

Select the best mode following the examples below.

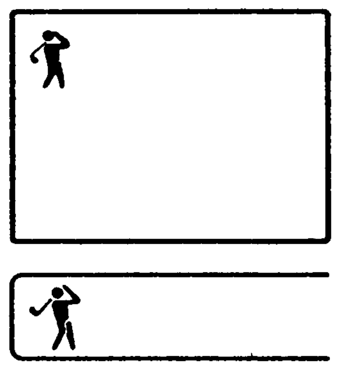
[a]



[b]



[c]



Portrait mode [a]

- A still subject such as a person or flower
- Subject behind an obstacle such as a net
- Zooming in on a subject in telehpoto

Sports mode [b]

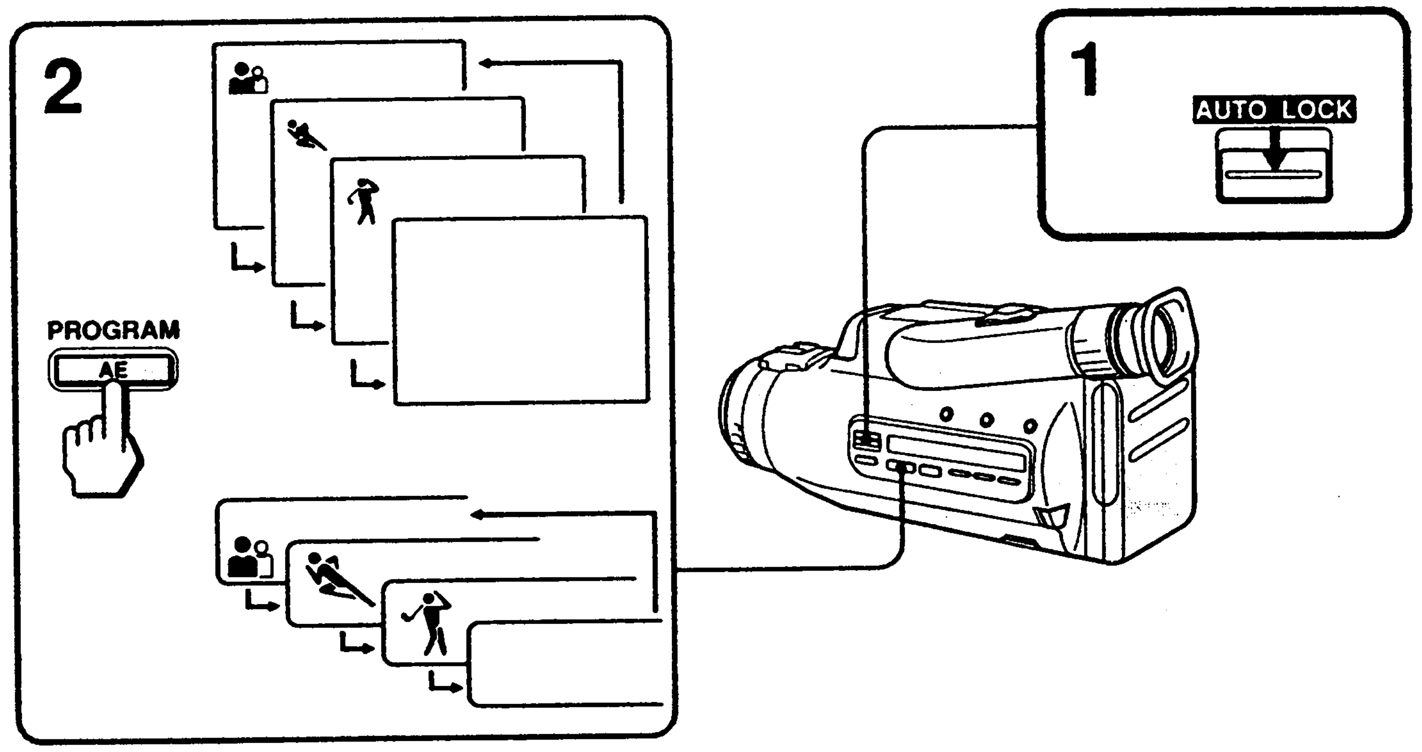
- Outdoor sports scenes such as football, tennis, golf or skiing
- A landscape in a moving car

High-speed Shutter mode [c]

- A golf swing or a tennis match in fine weather with the ball captured clearly
- Playing back certain scenes with high-speed movements in clear, sharp picture

Using the PROGRAM AE Function

(1) Slide AUTO LOCK down. (2) Press PROGRAM AE repeatedly until your reguired mode appears in the display window and viewfinder.



Note on shutter speed
The shutter speed in each PROGRAM AE mode is as follows:
Portrait mode - between 1/60 and 1/2000
Sports mode - between 1/60 and 1/500
High-speed Shutter mode - 1/4000

Fade-in and Fade-out

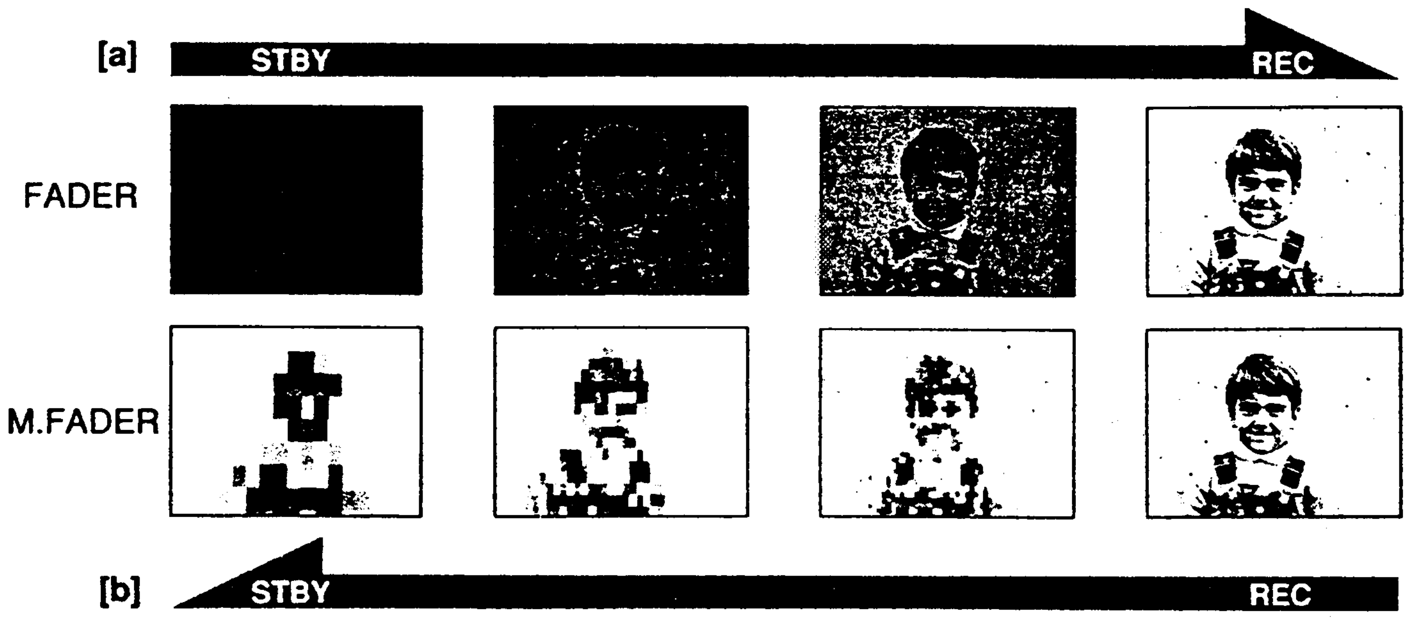
You can fade in or fade out to give your recording a professional appearance. When fading in, the picture will gradually appear from black or mosaic. The sound will also gradually increase. When fading out, the picture will gradually fade to black or mosaic. The sound will also decrease.

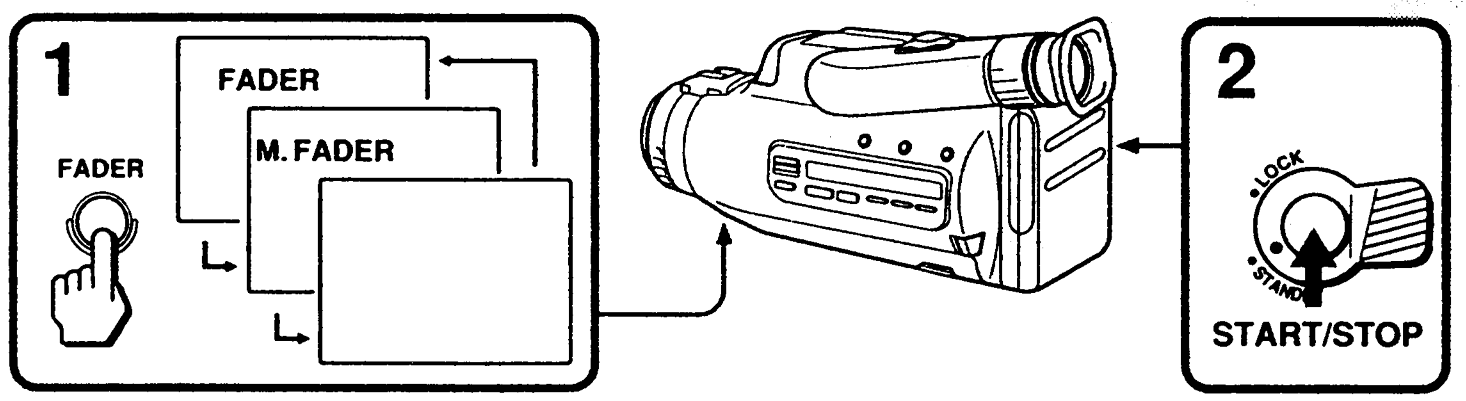
When Fading in [a]

(1) During the camcorder is in Standby mode, press FADER. The FADER indicator starts flashing.
(2) Press START/STOP to start recording. The FADER indicator stops flashing.

When Fading out [b]

(1) During recording, press FADER. The FADER indicator starts flashing. (2) Press START/STOP to stop recording. The FADER indicator stops flashing.





To Cancel the Fade-in/out Function

Before pressing START/STOP, press FADER once or twice until you have neither the FADER nor M.FADER indicator in the viewfinder.

When the date/time or age indicator is displayed
The date/time or age does not fade in nor fade out.

Using the Tape Counter

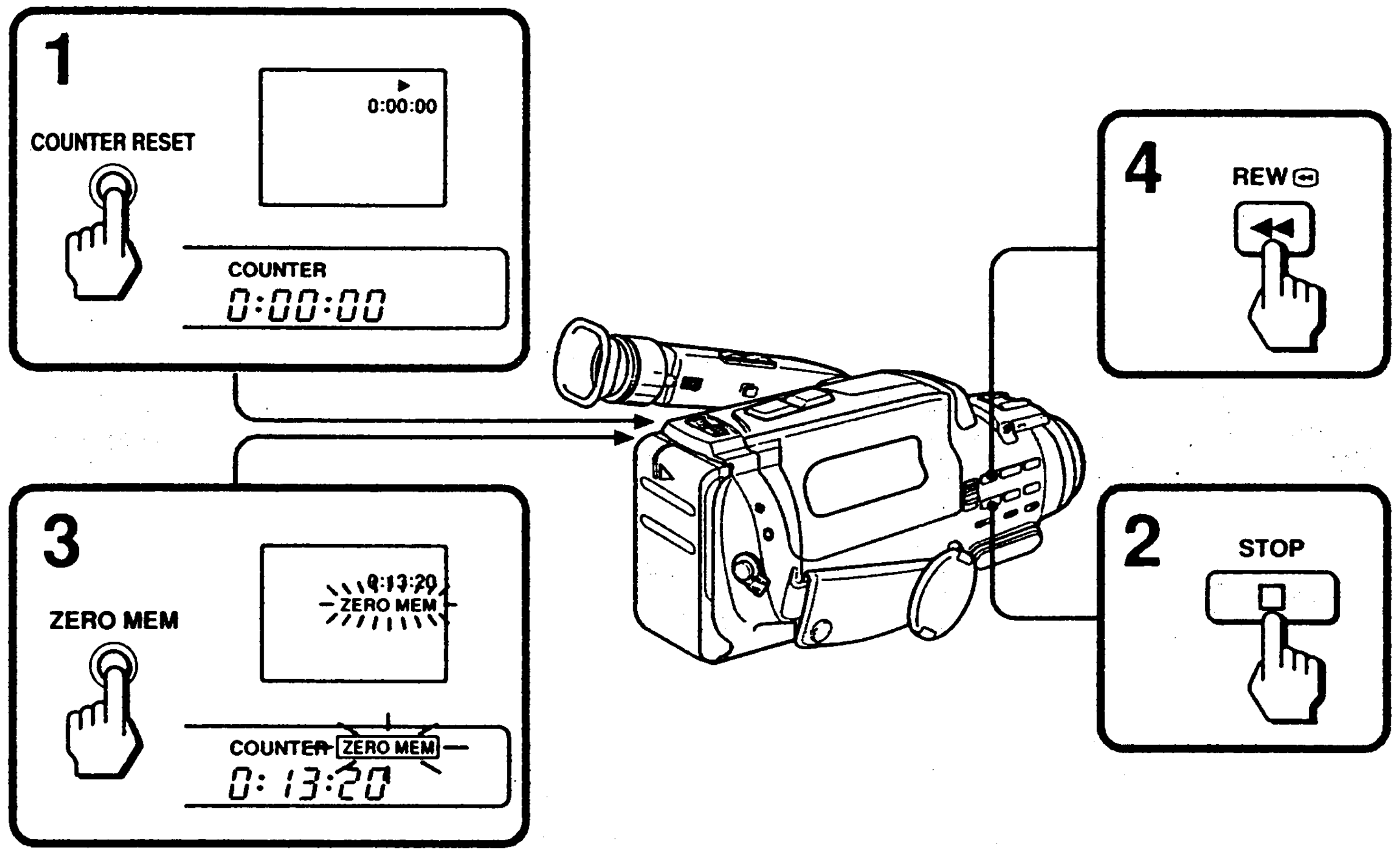
During recording or playback, the tape counter indicates the elapsed recording or playback time.

Referring to the Amount of Elapsed Time and a Particular Point

Press COUNTER RESET at the beginning of the tape. The counter in the viewfinder displays "0:00:00". The counter shows the elapsed time so that you can refer to the amount of elapsed time. You can also use the counter as an index to find a particular point

Returning to a Pre-registered Position

You can easily go back to the desired point on a tape after playback.
(1) During playback, press COUNTER RESET at the point you later want to locate. The counter shows "0:00:00". (2) Press □ when you want to stop playback. (3) Press ZERO MEM to stop rewinding at the counter's zero point. The "ZERO MEM" indicator flashes in the display window. (4) Press ◀◀. The tape stops automatically when the counter reaches approximately zero.



Notes on the tape counter
- Something must be recorded on the tape in order for the tape counter to function. Tape counter does not work on a blank tape.
- There may be a discrepancy of several seconds from the actual time.

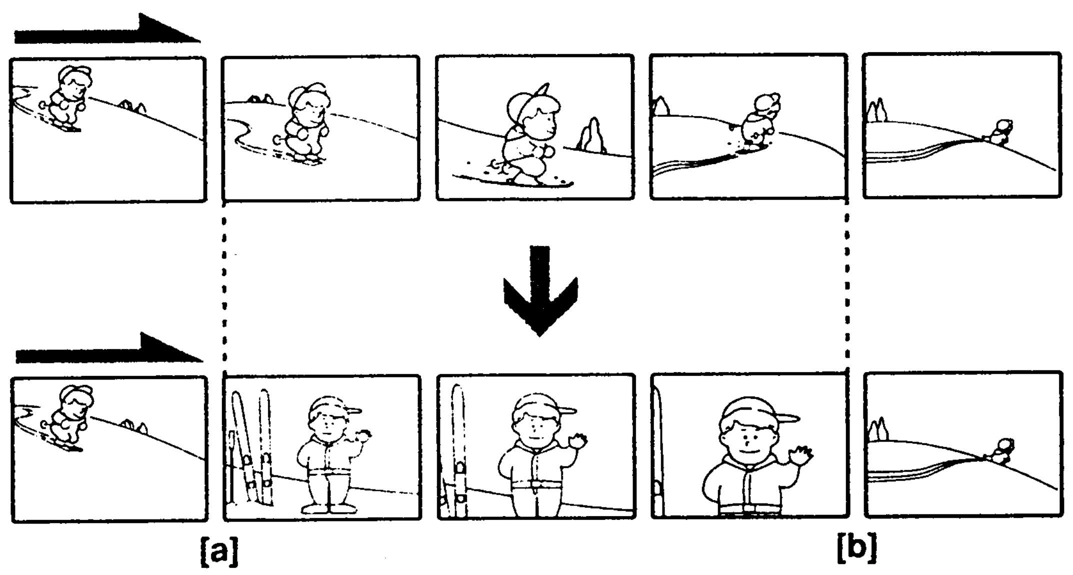
Notes on ZERO MEM
- The ZERO MEM mode is cancelled automatically once the tape is rewound or sent forward to the point you pre-registered.
- Be sure to press ZERO MEM after stopping the tape. It does not function during recording or playing back.
- When you press ZERO MEM, the counter's zero point is memorized.

Using this function in Reverse

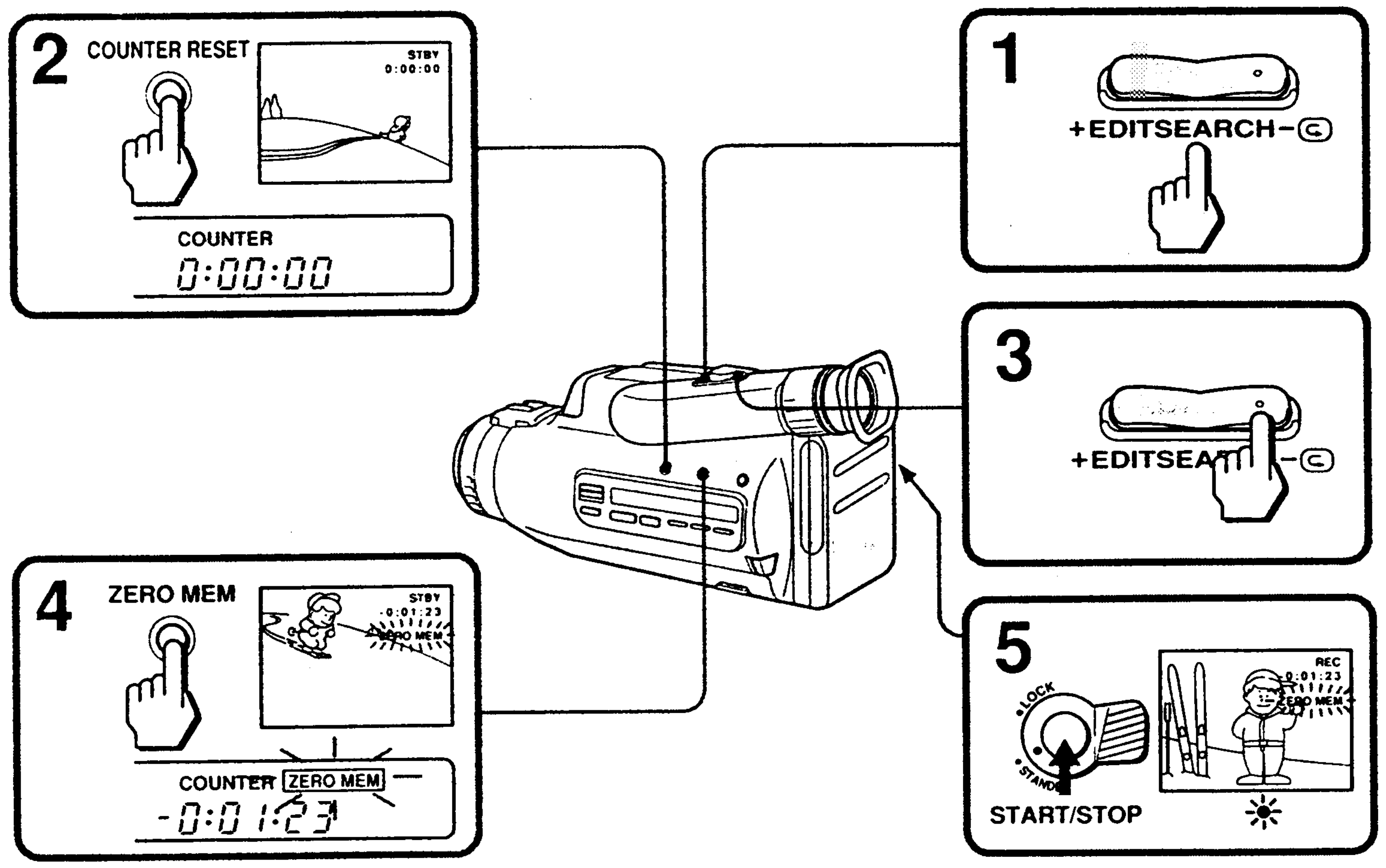
You can locate a desired position after rewinding with this function. Press COUNTER RESET at the point where you want to locate later. Press ◀◀. Press □ when you want to stop rewinding. Press ZERO MEM. Press ▶▶. The tape automatically stops near the zero point you first set.

Inserting a Scene in the Middle of a Recorded Tape

You can insert a scene in the middle of a recorded tape by setting the starting point and ending point. A previously recorded portion will be erased



(1) While looking in the viewfinder in Standby mode, keep pressing the + or – side of EDITSEARCH and release the button where you want to end the insertion [b]. (2) Press COUNTER RESET to set counter to zero. (3) While looking in the viewfinder, keep pressing the – side of EDITSEARCH and release the button where you want to start the insertion [a]. (4) Press ZERO MEM to stop recording of insert at the counter's zero point. (5) Press START/STOP. Insert recording begins. The insert recording stops automatically at the counter's zero point.



Canceling the ZERO MEM

Press ZERO MEM. The ZERO MEM indicator disappears.

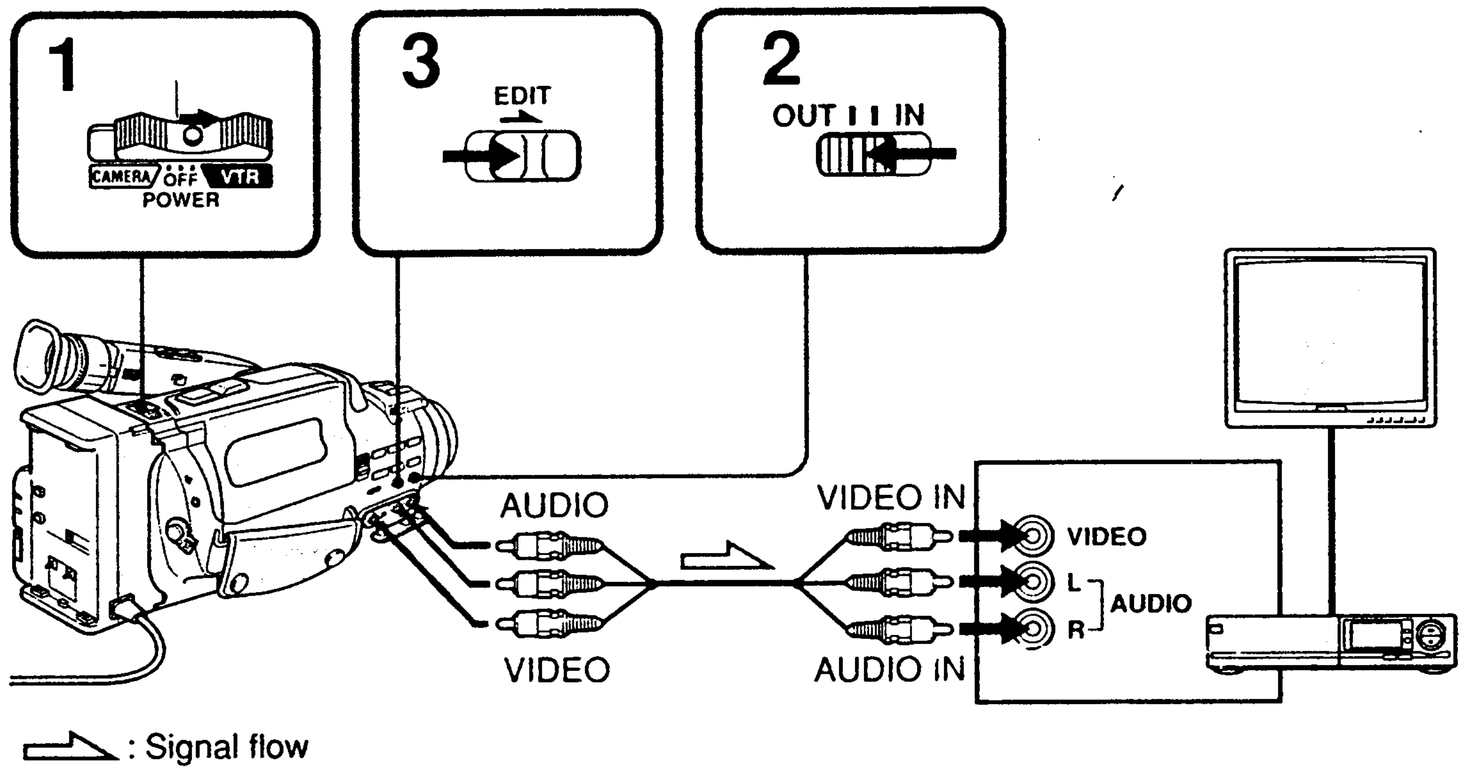
Note on the recorded picture
The picture may be distorted at the end point during playback.

Editing onto Another Tape

You can create your own video program by editing with any other 8 8 mm, Hi8 Hi8, B Betamax, VHS VHS, S VHS S-VHS, VHS C VHSC, or S VHS C S-VHSC VCR that has audio/video inputs.

Before Editing

After connecting the camcorder to your VCR (p. 22–24). (1) Set the POWER switch to VTR. (2) If you do not use the connecting adaptor, set IN/OUT to OUT. (3) Slide EDIT on the camcorder in the direction of the arrow.



To Start Editing

(1) Insert a blank tape (or a tape you want to record over) into the recording VCR. Then insert your recorded tape into the camcorder. (2) Play back the recorded tape on the camcorder until you locate the point where you want to start editing. Then set the camcorder to playback pause mode. (3) Set the recording VCR to recording pause mode. (4) Press II on the camcorder and VCR simultaneously to start editing.

To Edit More Scenes

Repeat steps 2 to 4.

To Stop Editing

Press □ on the camcorder and VCR.

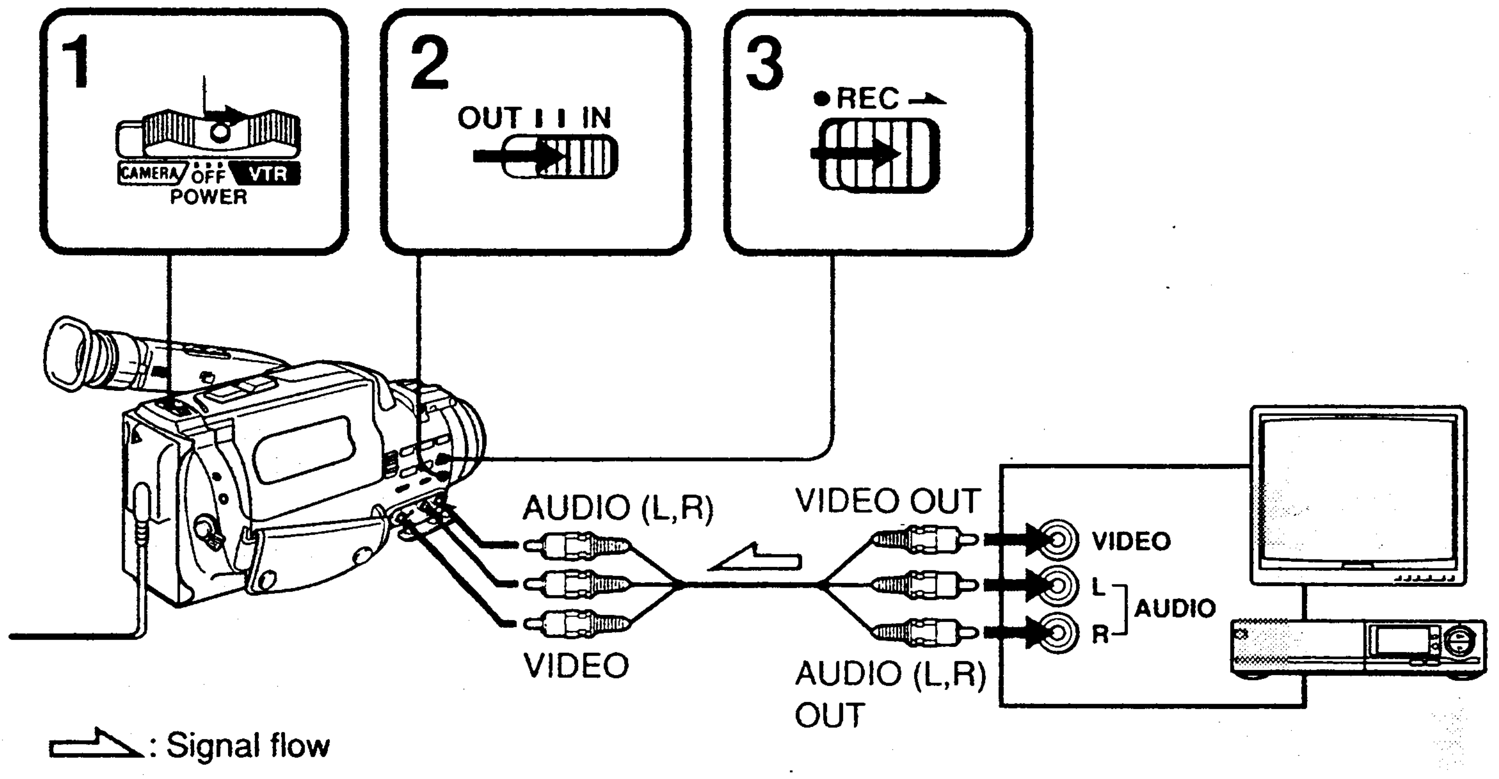
Use of the EDITSEARCH button
To play back a tape in the forward or reverse direction, keep pressing EDITSEARCH during playback pause. You can play back still pictures successively at specific intervals by pressing EDITSEARCH intermittently.

Note on the DATA SCREEN function
If you have displayed the viewfinder screen indicators on the TV (DATA SCREEN function), erase the indicators by pressing DATA SCREEN on the Remote Commander so that they will not be recorded on the edited tape.

Notes on EDIT
- It functions when using the camcorder as a VCR for playback.
- By using EDIT, you can keep picture and sound deterioration resulting from editing to a minimum.
- Avoid recording re-recorded tapes.

Recording from a TV or VCR

You can record a tape from another VCR or TV that has audio/video outputs. Connect the camcorder to the TV or VCR. (1) Set the POWER switch to VTR. (2) Set IN/OUT to IN. (3) Slide ● at the point where you want to start recording.


1
CAMERA OFF VTR
POWER
2
OUT IN
3
●REC
AUDIO (L,R)
VIDEO OUT
VIDEO
L
R
AUDIO
VIDEO
AUDIO (L,R) OUT
: Signal flow

To Check the Picture from a TV or VCR before Recording

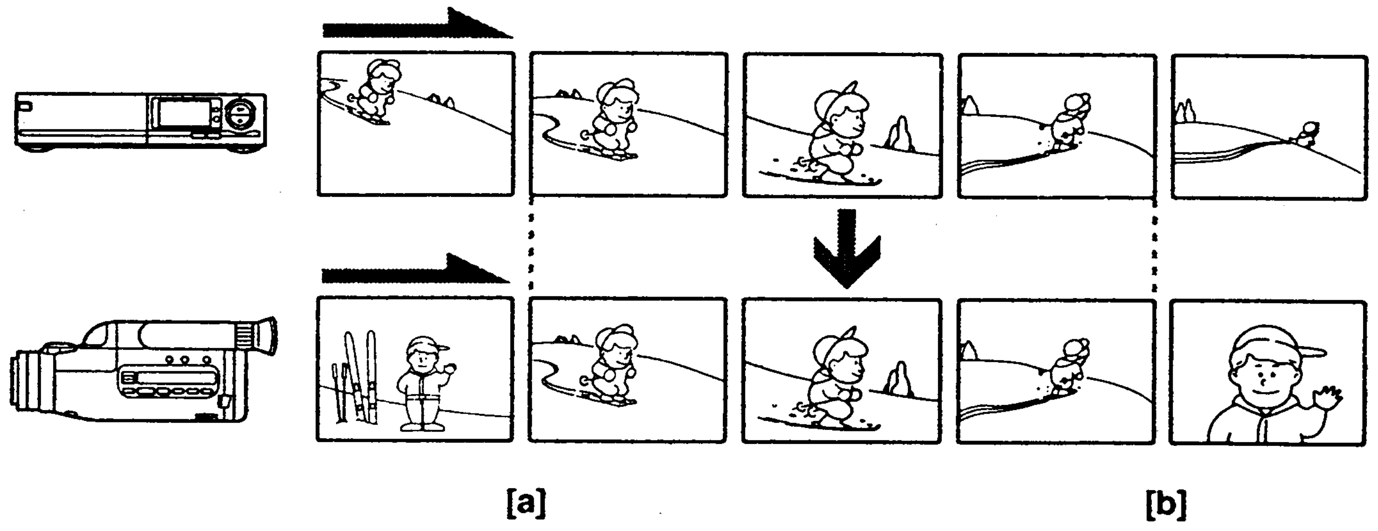
Slide ●, and then press **II** to check the picture in the viewfinder. If you take time to press **II** after sliding ●, recording starts.

To Stop Recording

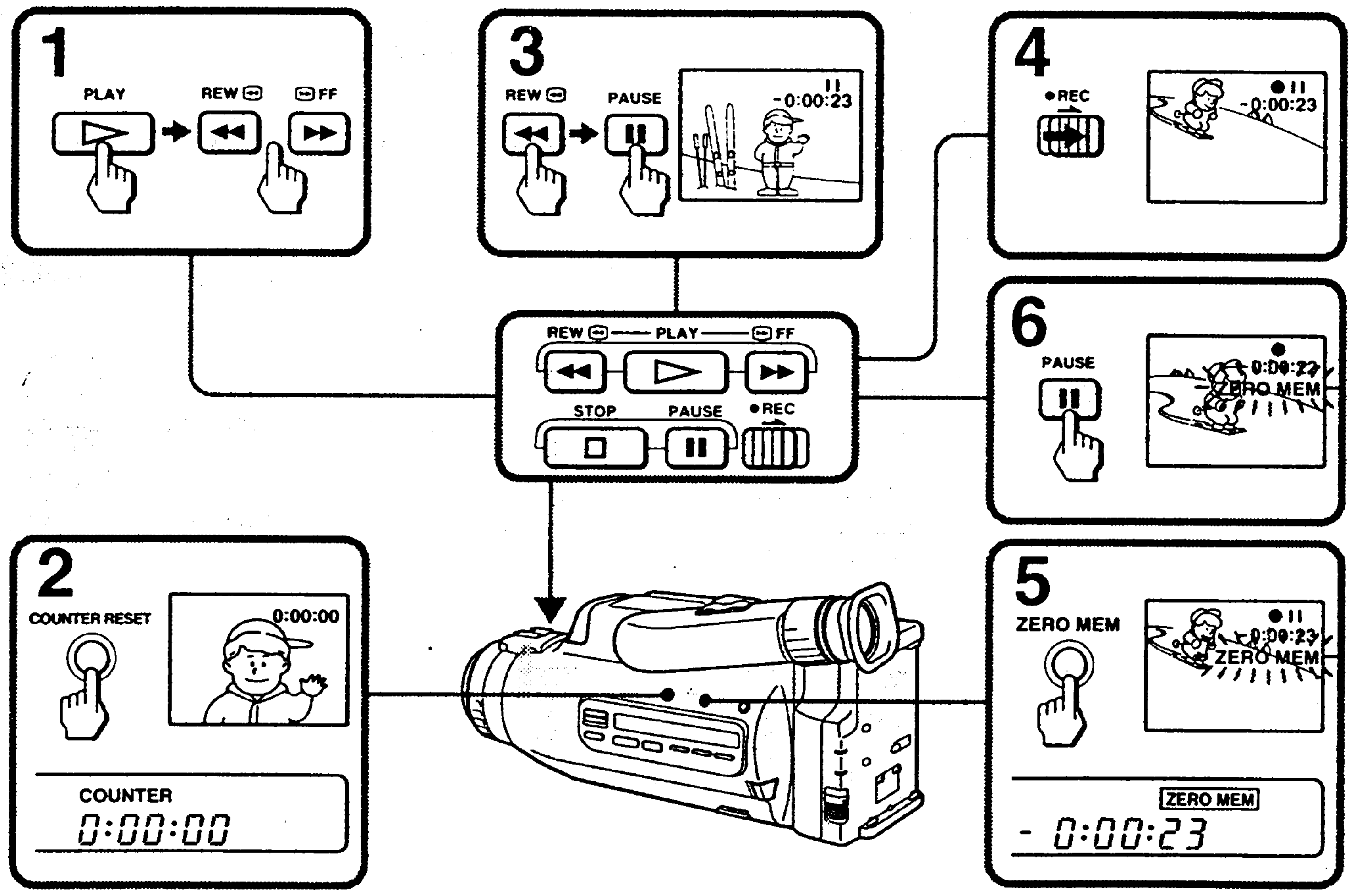
Press □.

To Replace Recording on a Tape (Insert Editing)

You can insert a new scene from a tape on a VCR into your originally recorded tape by setting the starting point and stopping point.



Before starting insert editing, **set your VCR to the playback pause mode at the beginning of the scene to be recorded.** (1) On your camcorder, locate the end point where the insert should end by pressing ◀◀ or ▶▶ after pressing ▷ **[b]**. (2) At the end point, press COUNTER RESET to set the counter to zero. (3) Locate the point where you want to start the insertion by pressing ◀◀ and press **II** **[a]**. (4) Slide ● to set the camcorder into recording pause mode. The picture in the viewfinder switches to the VCR. (5) Press ZERO MEM to stop recording at the counter's zero point. The end point of the insert is stored in memory. (6) Press **II** on the camcorder and the VCR to start insert editing. You can monitor the picture being inserted in the viewfinder screen. The insert recording stops automatically near the zero point on the camcorder's counter.


1
PLAY
REW
FF
3
REW
PAUSE
-0:00:23
4
●REC
-0:00:23
6
PAUSE
0:00:23
ZERO MEM
REW — PLAY — FF
STOP
PAUSE
●REC
2
COUNTER RESET
0:00:00
COUNTER
0:00:00
5
ZERO MEM
0:00:23
ZERO MEM
ZERO MEM
-0:00:23

To Change the End Point

Press ZERO MEM so that the ZERO MEM indicator disappears, and begin again from step 1.

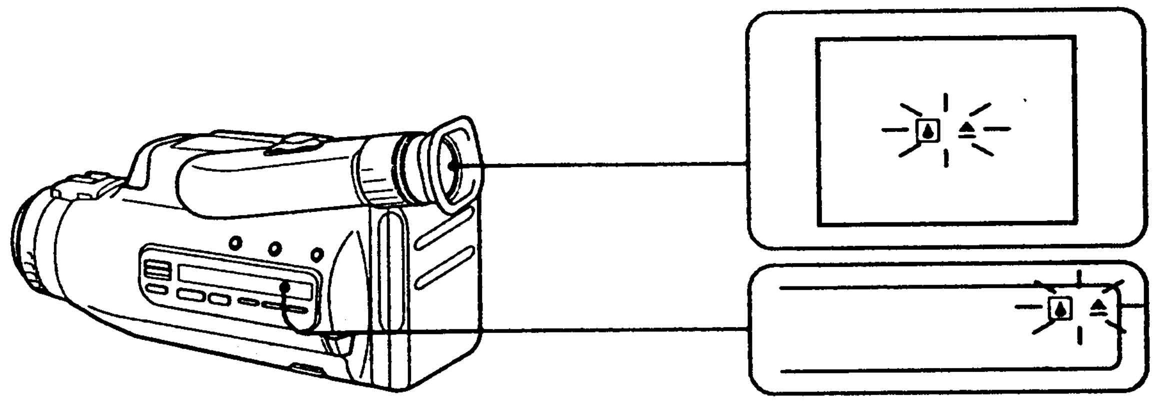
Maintenance Information and Precautions

Moisture Condensation

If the camcorder is brought directly from a cold place to a warm place, moisture may condense inside the camcorder, on the surface of the tape, or on the lens. If this happens, the tape may stick to the head drum and be damaged or the camcorder may not operate correctly. To prevent possible damage under these circumstances, the camcorder is furnished with moisture sensor. However, take the following precautions.

Inside the Camcorder

When the ▣ and ⏏ indicators flash in the display window and the viewfinder, moisture has condensed inside the camcorder. If this happens, none of the functions except cassette ejection will work.
Eject the tape, turn off the camcorder, and leave it with the cassette compartment open for about 1 hour.
If the ▣ indicator does not light up when you turn on the power, you can use the camcorder again.



On the Surface of the Tape

If there is moisture on the surface of the tape when you insert the tape and press a tape transport button, the ⏏ indicator flashes in the viewfinder and the display window. If this happens, none of the function except cassette ejection will work.
Eject the tape and let it sit for about 1 hour.
If the ⏏ indicator does not light up when you insert the tape and press a tape transport button, you can use the camcorder again.

On the Lens

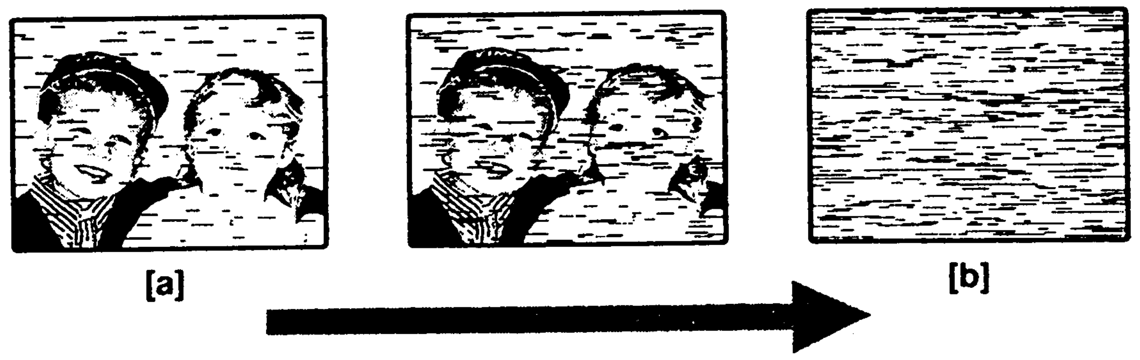
No indicator will appear, but the picture becomes dim. Turn off the power and do not use the camcorder for about 1 hour.

How to Prevent Moisture Condensation

When bringing the camcorder from a cold place to a warm place, put the camcorder in a plastic bag and allow it to adapt to room conditions over a period of time.
(1) Be sure to tightly seal the plastic bag containing the camcorder.
(2) Remove the bag when the air temperature inside it has reached the temperature surrounding it (after about 1 hour).

Video Head Cleaning

To ensure clear pictures, clean the video heads periodically. When playback pictures are "noisy", or hardly visible, the video heads may be contaminated.



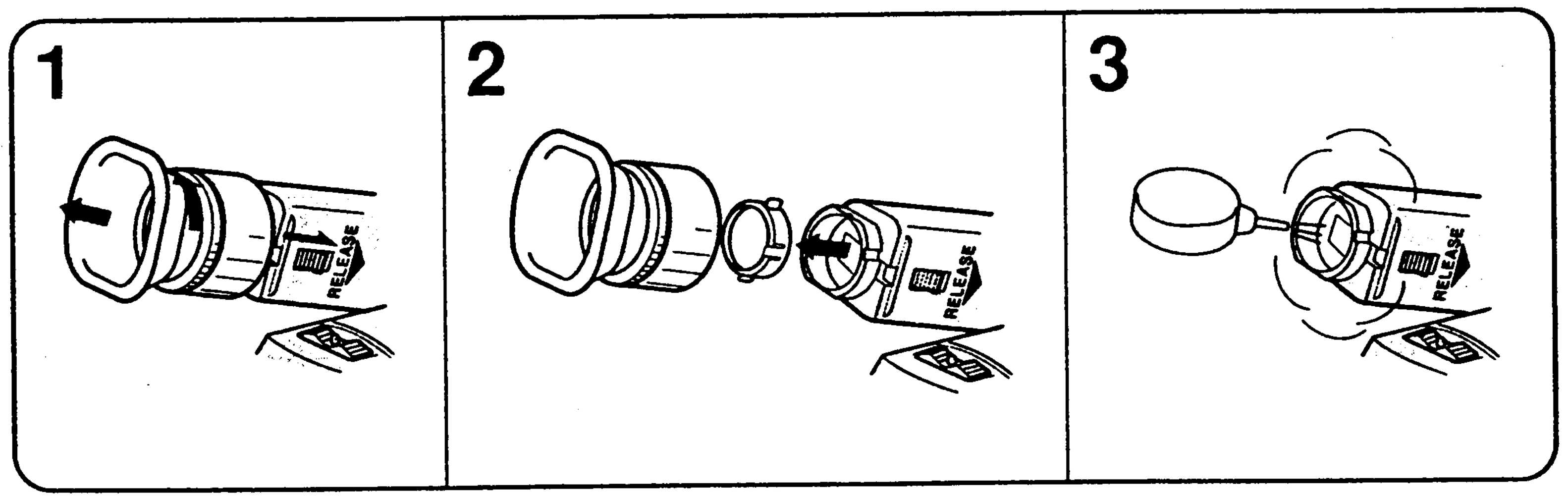
[a] Slight contamination
[b] Critical contamination
If this happens, clean the video heads with the Sony V8-25CLH cleaning cassette (not supplied). After checking the picture, if it is still "noisy", repeat the cleaning. (Do not repeat cleaning more than 5 times.)

Caution
Do not use a commercially available wet-type cleaning cassette. It may damage the video heads.

Note
If the V8-25CLH cleaning cassette is not available in your area, consult your Sony service facility.

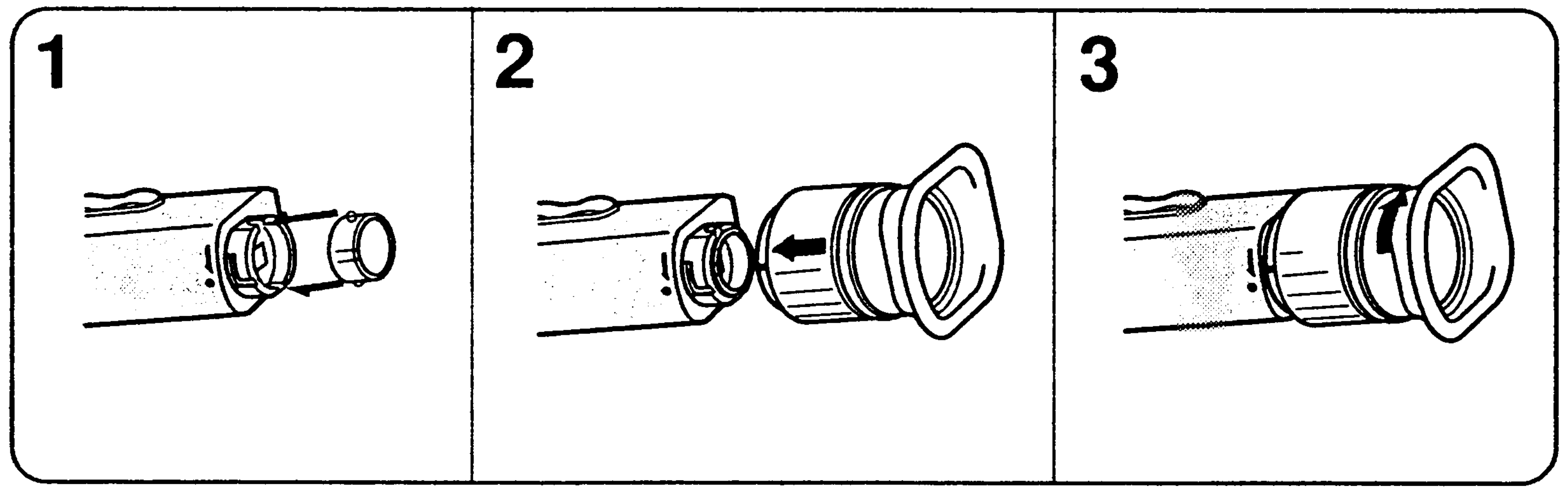
Removing Dust from Inside the Viewfinder

(1) While holding down the switch on the viewfinder barrel, turn the eyecup in the direction of the arrow and pull it up to detach the eyecup. (2) Remove the small lens from the inside of the viewfinder. (3) Clean the surface of the screen with a commercially available blower.



To Reattach the Eyecup

(1) Replace the small lens inside the viewfinder. (2) Align the groove on the eyecup with the • mark on the barrel. (3) Turn the eyecup clockwise.

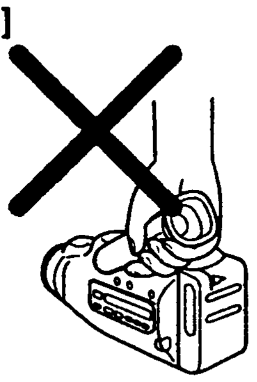


Precautions

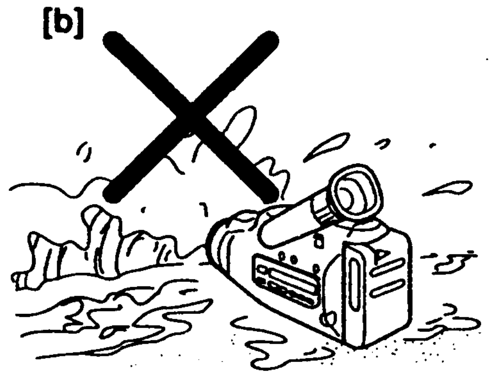
Camcorder Operation

- Operate the camcorder on 6.0 V (battery pack) or 7.5 V (AC power adaptor).
- For DC or AC operation, use the accessories recommended in this manual.
- Should any solid object or liquid fall into the casing, detach the power source from the camcorder and have the camcorder checked by qualified personnel before operating it any further.
- Do not hold the camcorder by the viewfinder.[a]
- Avoid rough handling or mechanical shock. Be particularly careful of the lens.
- Keep the lens cap on the lens when not using the camera.
- Do not wrap up the camcorder and operate it since heat may build up internally.
- Keep the camcorder away from strong magnetic fields or mechanical vibration.
- **Do not let sand get into the camcorder. When you use the camcorder on a sandy beach or dusty place, protect it from the sand or dust. Sand or dust may cause the unit to malfunction and sometimes the malfunction cannot be repaired.[b]**
- **Do not let the camcorder get wet. Keep the camcorder from rain or sea water. It may cause a malfunction and sometimes the malfunction cannot be repaired.[c]**

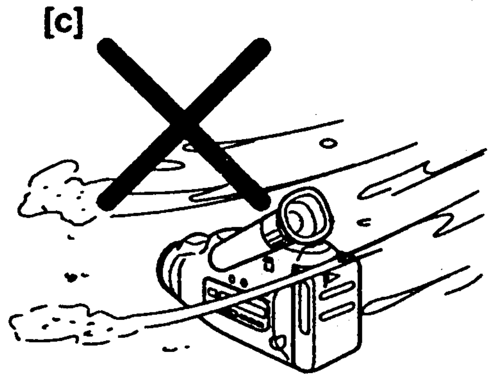
[a]



[b]



[c]



Camcorder Care

- Never leave the camcorder under temperatures above 140°F (60°C) , such as in a car parked in the sun or under direct sunlight.
- When the camcorder is not to be used for a long time, disconnect the power source and remove the tape. Periodically turn on the power, operate the camera and VTR sections and play back a tape for about 3 minutes.
- Clean the lens with a soft brush to remove dust. If there are fingerprints on the lens, remove them with a soft cloth.
- Clean the camcorder body with a soft dry cloth, or a soft cloth lightly moistened with a mild detergent solution. Do not use any type of solvent which may damage the finish.

Handling Tapes

- Do not insert anything into the small holes on the rear of the cassette. These holes are used to sense the type, thickness of the tape, or if the tab is out or in.

AC Power Adaptor Care

Charging

- **Repeated charging while some capacity remains causes a lowering of battery capacity. However, the original battery capacity can be recovered if you use the battery completely and charge it fully again.**
- Charge the battery on a flat place without vibration.
- The battery will get hot during charging. But it is normal.
- Do not continuously recharge a charged battery pack as that will cause the battery pack efficiency to deteriorate.

Charging temperature

The temperature range for charging is 41°F to 95°F (5°C to 35°C). However, to prevent maximum battery efficiency, the recommended temperature range is 50°F to 86°F (10°C to 30°C).

Others

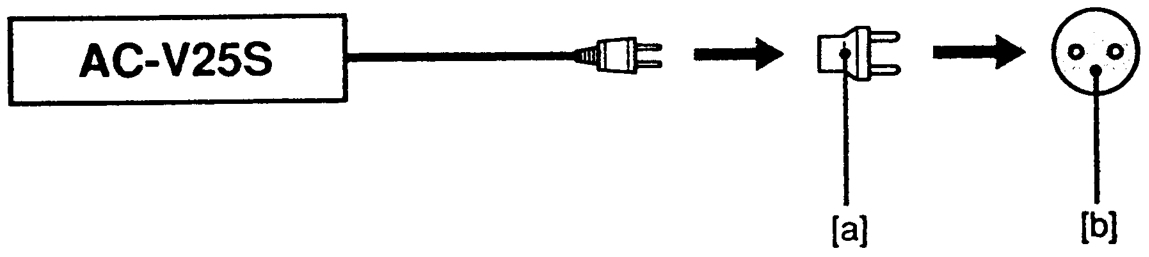
- The model for USA or Canada: One blade of the plug is wider than the other for the purpose of safety and will fit into the power outlet only one way. If you are unable to insert the plug fully into the outlet, contact your dealer.
- Disconnect the AC power cord of the unit from the wall outlet when not in use for a long time. To disconnect the cord, pull it out by the plug. Never pull the cord itself.
- Do not operate the unit with a damaged cord or if it has been dropped or damaged.
- Do not bend the AC power cord forcibly, or put a heavy object on it. This will damage the cord and may cause a fire or an electrical shock.
- Be sure that nothing metallic comes into contact with the metal parts of the connecting surface. If it does, a short may occur and the unit may be damaged.
- Always keep the metal contacts clean.
- Do not disassemble the unit.
- Do not apply mechanical shock or drop the unit.
- While the unit is in use, particularly during charging, keep it away from AM receiver and video equipment because it will disturb AM reception and video operation.
- Do not place the unit in locations where it is:
  —Extremely hot or cold
  —Dusty or dirty
  —Very humid
  —Vibrating
- If any difficulty should arise, disconnect the AC power cord of the unit and connect the nearest Sony dealer.

Using Your Camcorder Abroad

Each country has its own electricity and TV color systems. Before using your camcorder abroad, check the following points:

Power Sources

You can use your camcorder in any country with the supplied AC power adaptor within 110 V to 240 V AC, 50/60 Hz. If you cannot attach the power adaptor to the wall outlet, use the commercially available AC plug adaptor [a]. Depending on the design of the wall outlet [b].



Difference in Color Systems

This camcorder is an NTSC system-based camcorder. If you want to view the playback picture on a TV, it must be an NTSC system-based TV. When you want to use a PAL-M system-based TV, you will need an NTSC/PAL-M transcoder (as this is an NTSC based camcorder). For TV system information check the following alphabetical list.

NTSC system countries
Bahama Islands, Bolivia, Canada, Central America, Chile, Colombia, Ecuador, Jamaica, Japan, Korea, Mexico, Peru, Surinam, Taiwan, the Philippines, the U.S.A., Venezuela, etc.

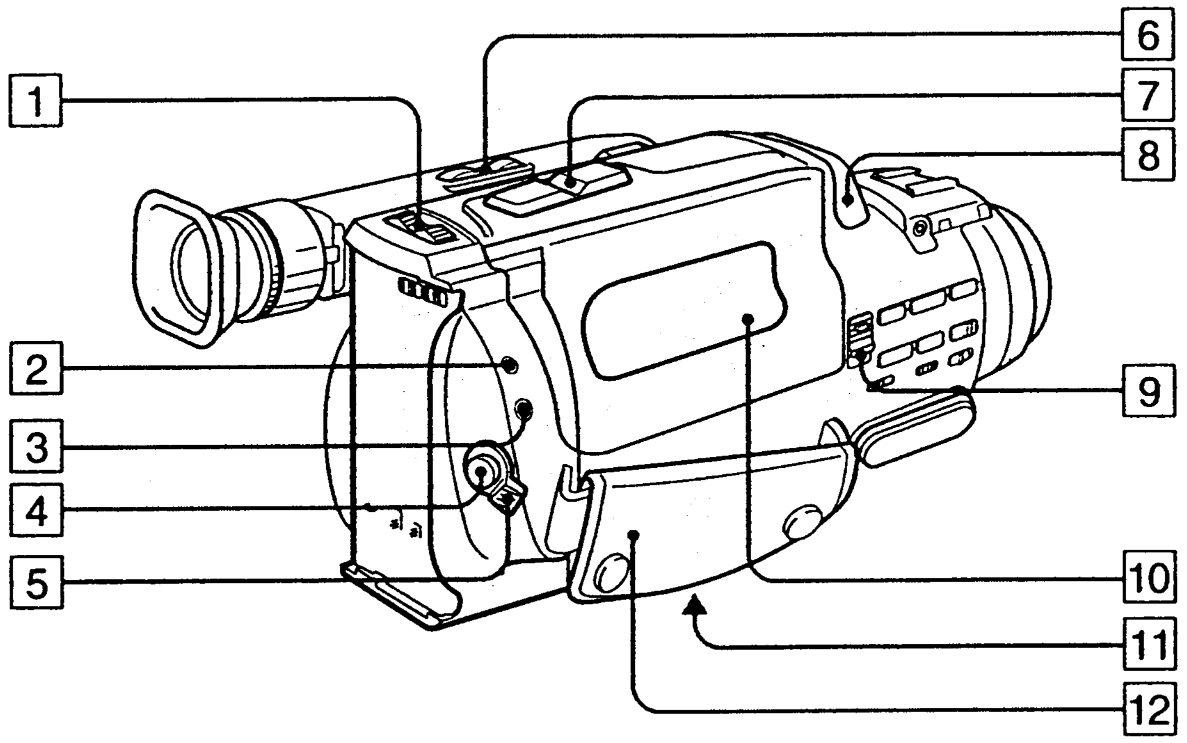
PAL system countries
Australia, Austria, Belgium, China, Denmark, Finland, Germany (former West Germany), Great Britain, Holland, Hong Kong, Italy, Kuwait, Malaysia, New Zealand, Norway, Portugal, Singapore, Spain, Sweden, Switzerland, Thailand, etc.

PAL M system countries
Brazil

PAL N system countries
Argentina, Paraguay, Uruguay

SECAM system countries
Bulgaria, France, Guyana, Hungary, Iran, Iraq, Monaco, Poland, former Soviet Union, etc.

Identifying the Parts



1 **POWER switch (p. 11)**
CAMERA: for camera recording
VTR: for playing back or editing tape
OFF: power off

2 **REMOTE ᑕ (LANC) control jack**
Connect the LANC ᑕ connecting cable of a wired remote control unit such as an editing controller. In this case, set ▣ REMOTE COMMANDER to OFF.(p. 26)
ᑕ (LANC) stands for Local Application Control Bus System. The ᑕ control jack is used for controlling the tape transport of video equipment and peripherals connected to it. This jack has the same function as the connectors indicated as CONTROL L or REMOTE.

3 **∩ (headphone) jack (minijack) (p. 21)**
Connect headphones (not supplied) to monitor the sound while viewing the playback or the recording picture.

4 **START/STOP button (p. 17)**
To start recording, press it after setting the POWER switch to CAMERA and turning STANDBY up.
To stop recording momentarily, press it again.

5 **STANDBY switch (p. 11)**
To set the camcorder to Standby mode (recording standby mode), set it up. To stop recording or to prevent from accidentally recording and wearing down the battery, set it down.

6 **EDITSEARCH (and ⊜ recording review) button (p. 21)**
Press it to check the recorded scene in the viewfinder in Standby mode.
+ side: to view the playback picture forward
– side: to view the playback picture in reverse

7 **Power zoom button (p. 19)**
Press it to change the size of the subject in the scene.
T side: for telephoto (subject appears closer)
W side: for wide-angle (subject appears further away)

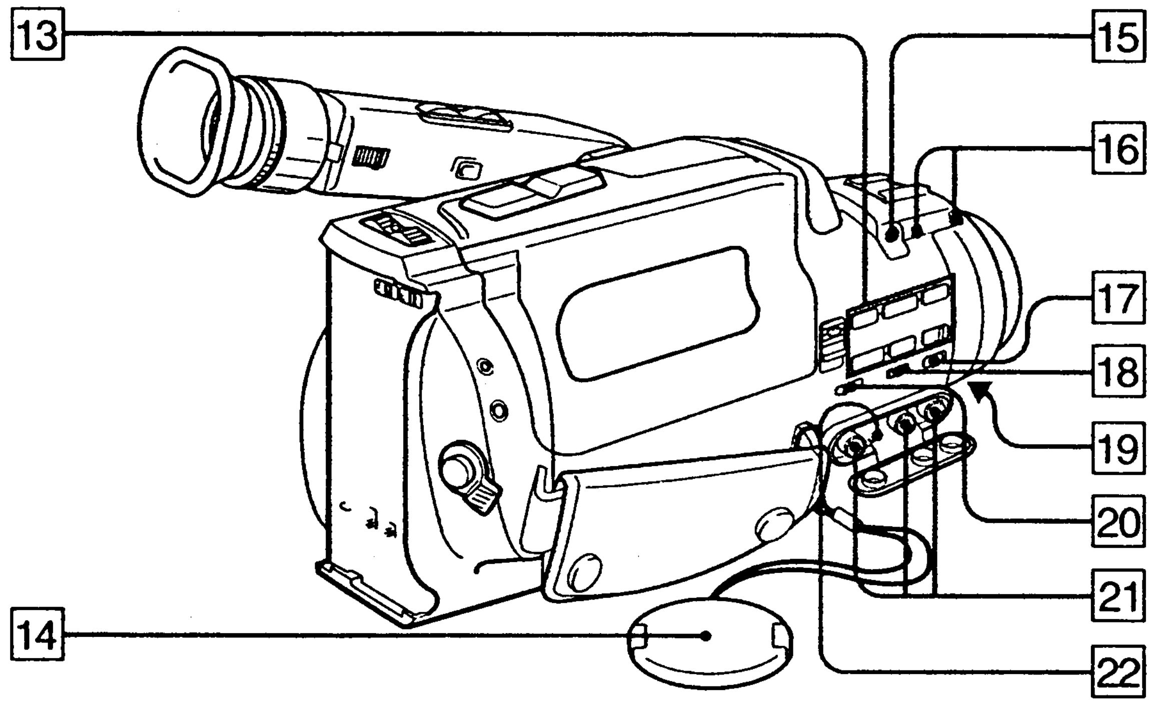
8 **Stereo built-in microphone**

9 **EJECT (cassette eject) button (p. 7)**
While pressing the blue button, slide it down to insert or eject a cassette.

10 **Cassette holder (p. 14)**

11 **Lithium battery holder (p. 10)**
Insert a lithium battery here to activate the clock.

12 **Grip strap (p. 16)**
Put your hand thorugh the grip strap to hold the camcorder. Adjust the length of the strap so that your thumb can easily touch START/STOP.



13 Tape transport buttons (p. 25)
□ STOP
◄◄ REW (rewind)
▷ PLAY (playback)
►► FF (fast forward)
II PAUSE
● REC (recording)
These buttons will function in VTR mode.

14 Lens cap (p. 17)
Attach it to the lens when not using the camera. Put it on the grip strap while camera recording.

15 MIC jack
Connect an optional external microphone (stereo). This jack also accepts a "plug-in-power" microphone. If the microphone has two plugs, connect the DC IN plug to the RFU DC OUT jack on the camcorder.

16 Remote control sensor (p. 49)
Aim the Remote Commander here for remote control.

17 IN/OUT (video and audio input/output) selector (p. 23)
Set it to OUT when playing back the tape. Set it to IN when recording or editing from a TV another VCR.

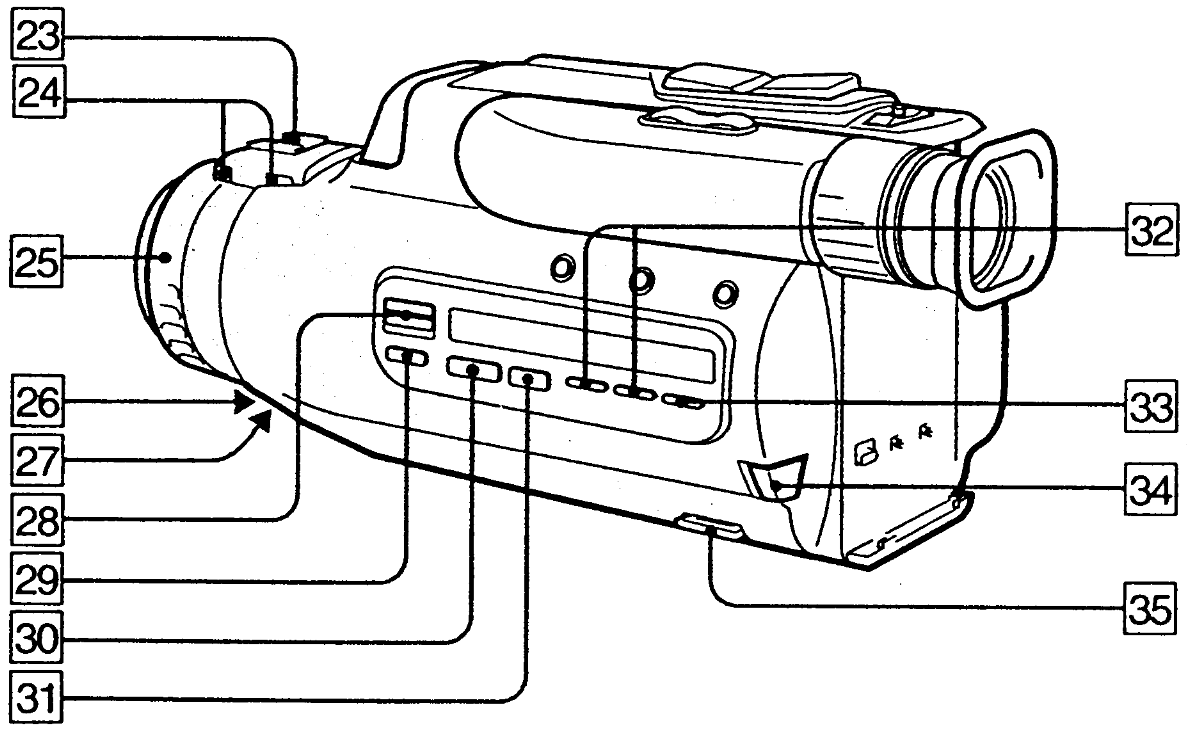
18 EDIT switch (p. 37)
Set it in the direction of the arrow when editing onto another tape.

19 Hook for shoulder strap (p. 49)

20 Hi-Fi SOUND selector (p. 25)
Normally set it to • position. When the tape with dual sound tracks is played back, set it to desired sound, 1 or 2.

21 AUDIO/VIDEO jacks (p. 23)
These jacks work as both input and output jacks by switching the IN/OUT selector on the camcorder. To view the recorded picture on the TV or to record onto another tape, connect these jacks and the audio/video input jacks on the TV or VCR using the A/V connecting cable (not supplied). To record from a TV or a VCR, connect these jacks and the audio/video output jacks on the TV or VCR.

22 RFU DC OUT (RFU adaptor DC output) jack (p. 23)
To view the recorded picture on the TV that has only an antenna input, connect the RFU adaptor here.



23 Accessory shoe
Attach the external microphone (not supplied) here.

24 Remote control sensor (p. 49)
Aim the Remote Commander here for remote control.

25 Focus ring (p. 31)
Turn it to adjust the focus manually and to achieve a sharp focus in manual focus mode.

26 FADER button (p. 34)
When starting recording with fading in, press the button and then start recording. When you conclude recording by fading out, press the button and then press START/STOP to stop recording. You can select black fader by pressing it once or mosaic fader by pressing it twice.

27 Tripod receptacle (bottom) (p. 16)
Attach a tripod (not supplied) here. When attaching a non-Sony tripod, make sure that the length of the camera mounting screw is shorter than 6.5 mm (9/32 inches). Otherwise, the screw might damage the inner part of the camcorder.

28 AUTO LOCK switch (p. 17)
Set it to the green position to make every adjustment automatic.

29 BACK LIGHT button (p. 29)
Press it when a recording subject is too dark because of excessively bright background.

30 PROGRAM AE button (p. 32)
Set the desired PROGRAM AE mode (Portrait/Sports/High-Speed Shutter mode) to fit the shooting situation.

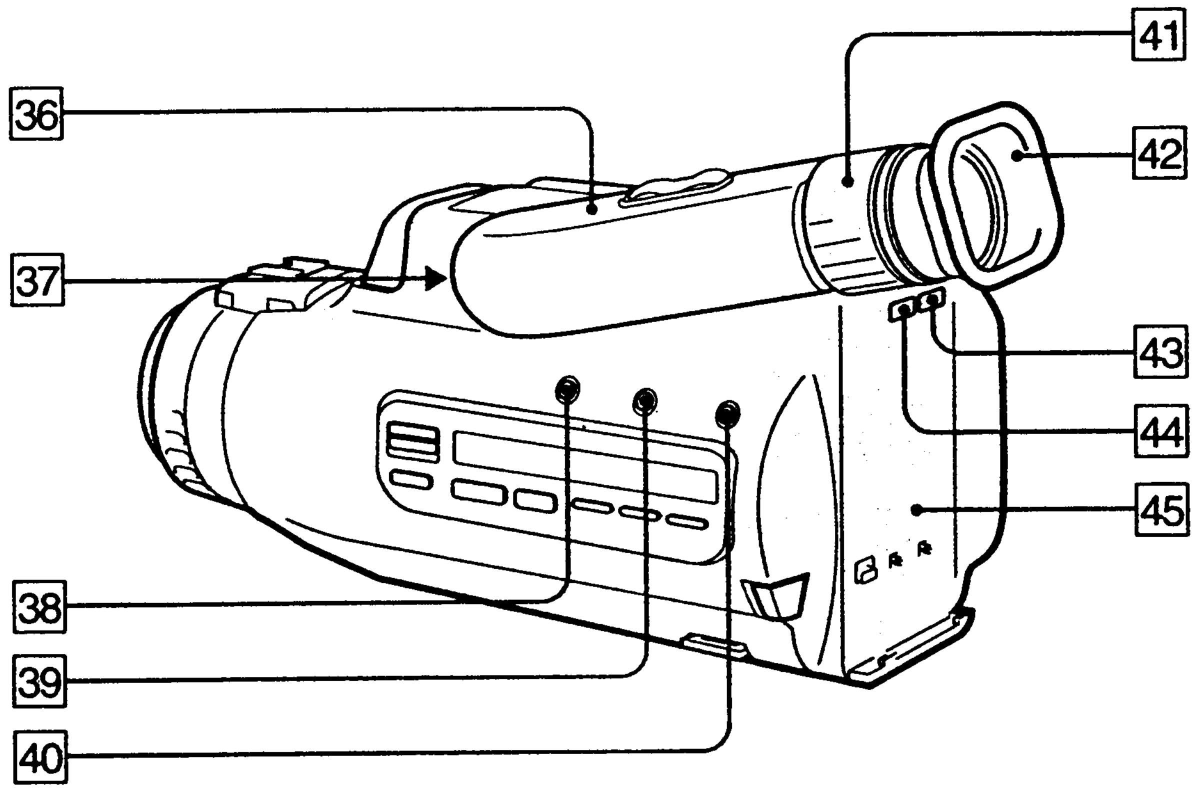
31 FOCUS button (p. 31)
Press to focus manually while AUTO LOCK function is not working.

32 DATE(+) and TIME(NEXT) buttons (p. 11)
Each button has two functions. One is to display the date or time indicator in the display window and the viewfinder. The other is to set the date and time. Pressing DATE (+) advances digits and pressing TIME (NEXT) sets the next factor while setting date and time.

33 AGE/EVENT button (p. 12)
Press when setting the birth date (or event date), or when displaying and turning off the age indicator in the viewfinder and the display window.

34 BATT (battery eject) knob (p. 7)
Keep pressing to detach the battery pack.

35 Hook for shoulder strap



36 Viewfinder (p. 15)
You can monitor the monochrome picture being recorded or played back. For details on the indicators in the viewfinder, see page 54.

37 Camera recording/battery lamp (p. 17)
This red lamp lights up while camera recording. when it flashes, the battery is almost empty or the tape is near its end.

38 COUNTER RESET button (p. 17, 35)
Press to reset the tape counter to zero.

39 ZERO MEM button (p. 35, 36)
Press to memorize the zero point of the tape counter. This will stop the tape at the counter's zero point. Press it while the tape transport is stopped or paused.

40 TAPE/BATT CHECK button (p. 18)
Press to display the tape remaining indicator or battery capacity remaining indicator in the viewfinder.

41 Viewfinder adjustment ring (p. 15)
To focus the viewfinder lens, turn this ring until the indicator in the viewfinder comes into sharp focus. To adjust the sports finder, turn the ring clockwise completely.

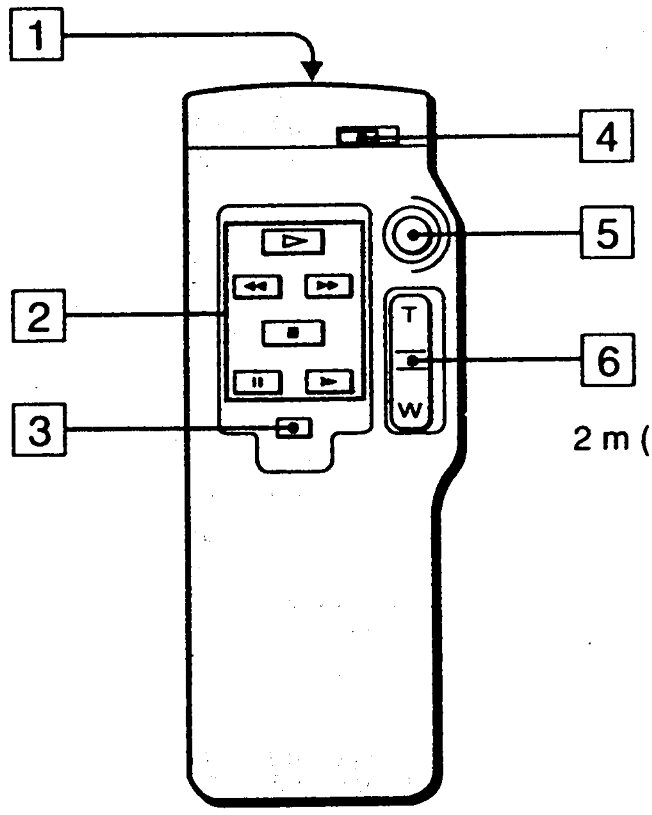
42 Eyecup
When looking in the viewfinder with glasses, bend back the eyecup.

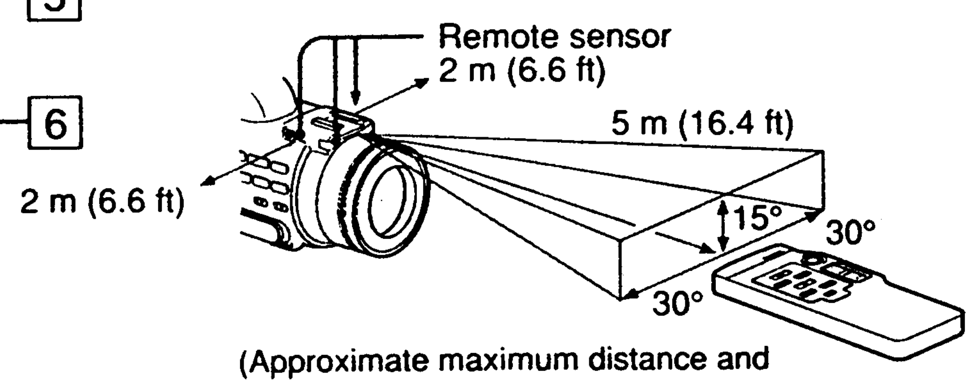
43 BEEP switch (p. 15)
Set to ON to beep when starting and stopping camera recording or when unusual conditions occur. To deactivate the beep, set it to OFF.

44 ▣ REMOTE COMMANDER switch (p. 26)
Set to ON to use the Remote Commander (supplied). When you connect a wired remote control unit to the camcorder, set it OFF.

45 Battery mounting surface

Wireless Remote Commander





(Approximate maximum distance and angles for remote control)

1 Transmitter
Point toward the remote sensor on the camcorder to remotely control the camcorder. Activate the camcorder before you use the Remote Commander.

2 Tape transport buttons (p. 25)

3 DATA SCREEN button
Press to display the viewfinder screen indicators on a TV when you connect the camcorder to a TV. To erase the indicators, press it again.

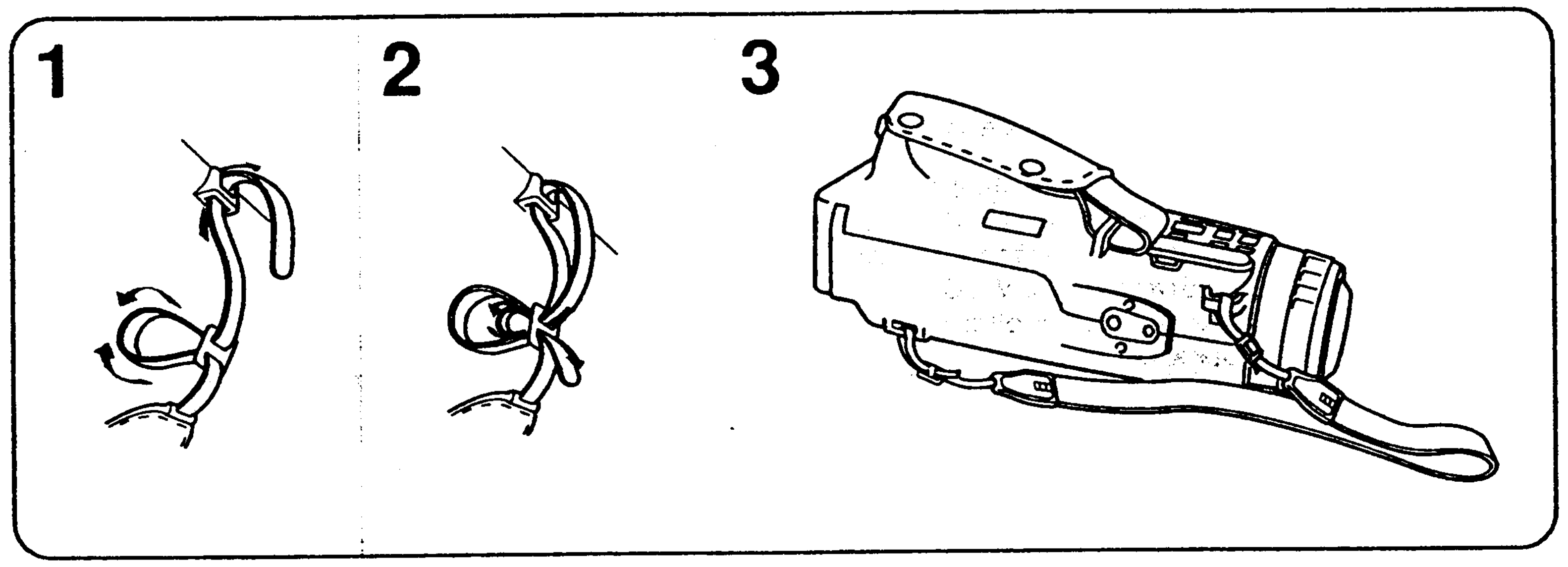
4 HOLD switch (p. 25)
Slide in the direction of the arrow to prevent the buttons from being accidentally pressed. Before using this Remote Commander, slide in the opposite direction of the arrow.

5 START/STOP button (p. 17)

6 Power zoom button (p. 19)

Attaching the Shoulder Strap

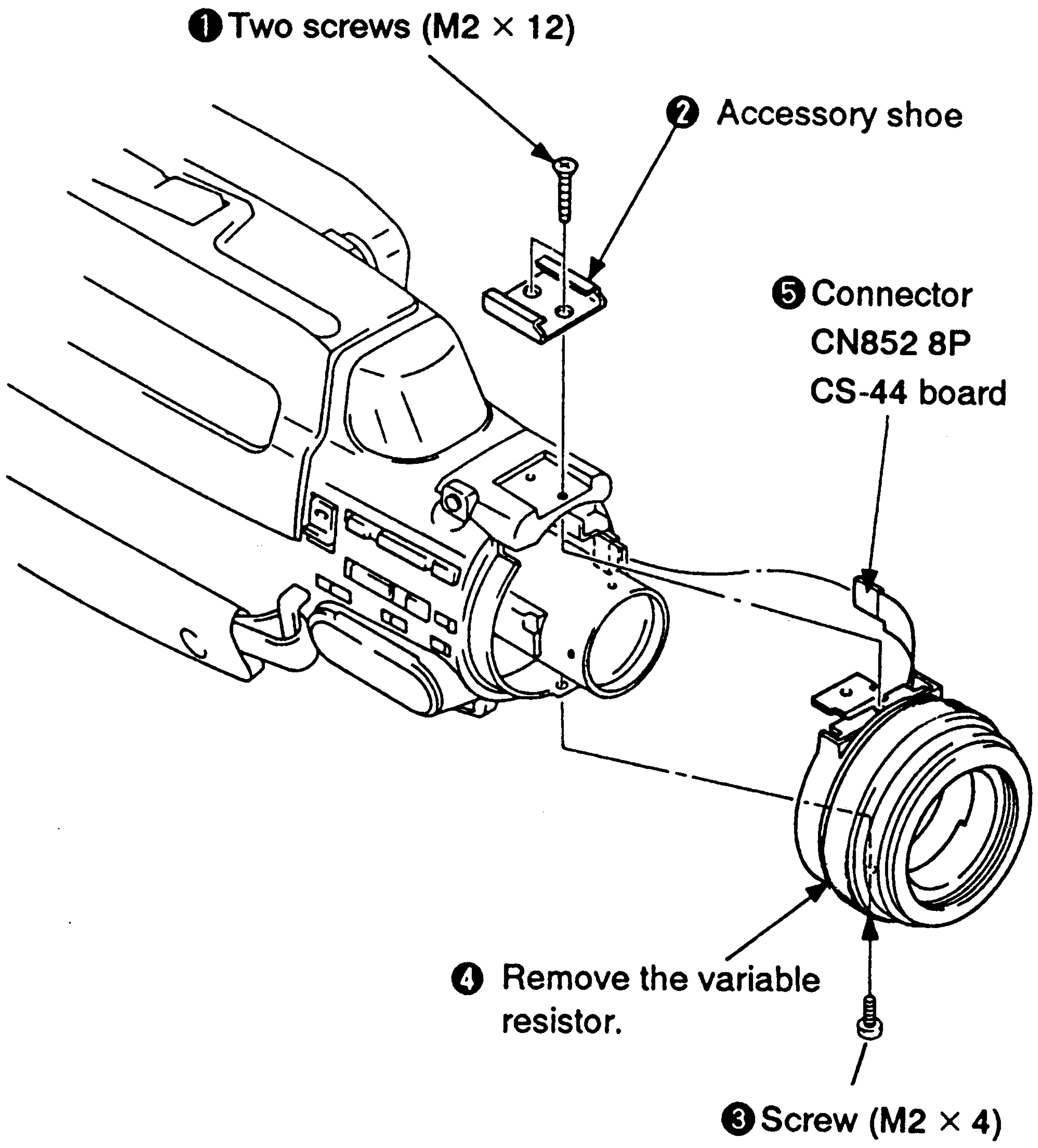
Attach the supplied shoulder strap to the hooks.



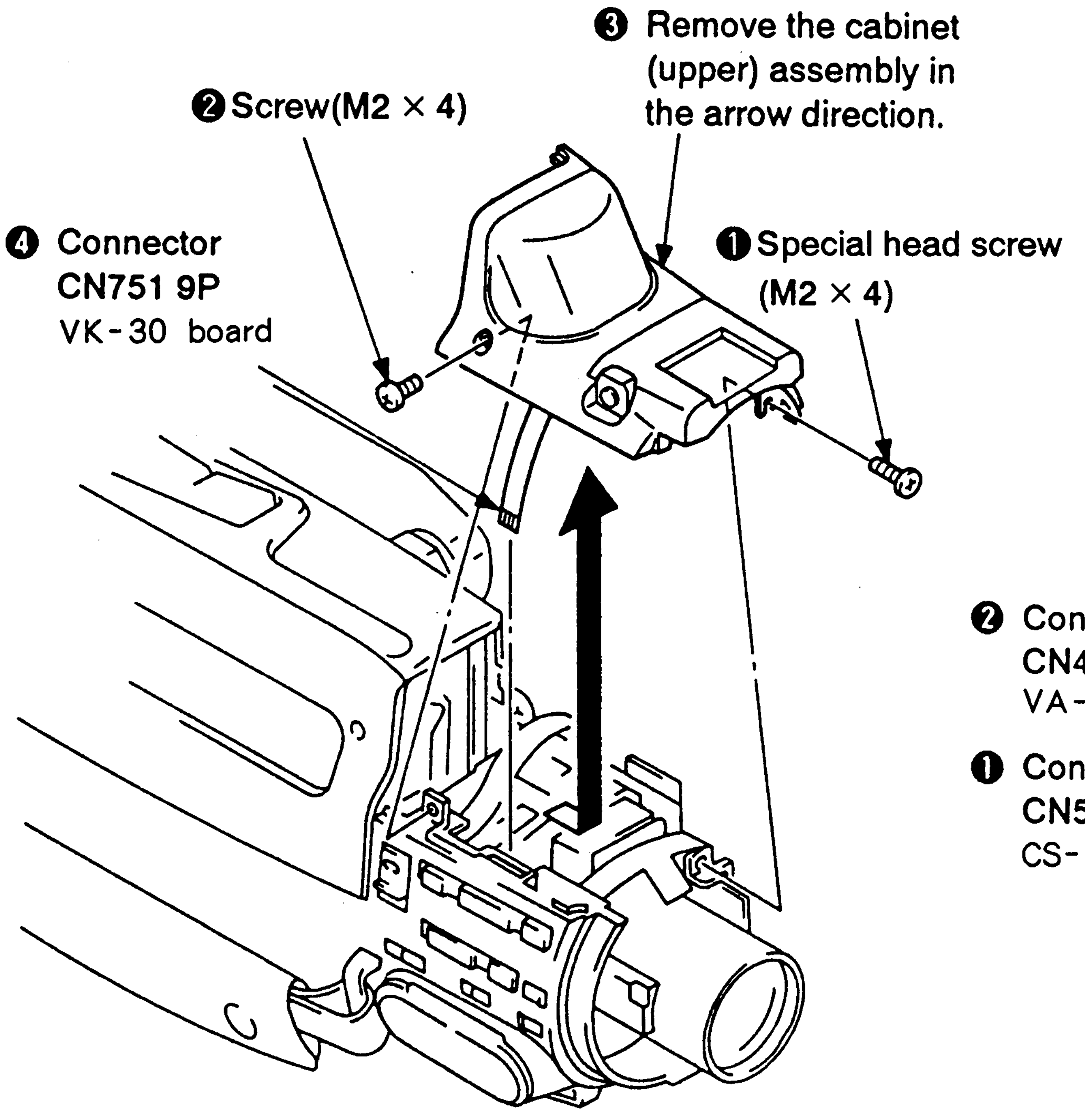
SECTION 2
DISASSEMBLY

NOTE : Follow the disassembly procedure in the numerical order given.

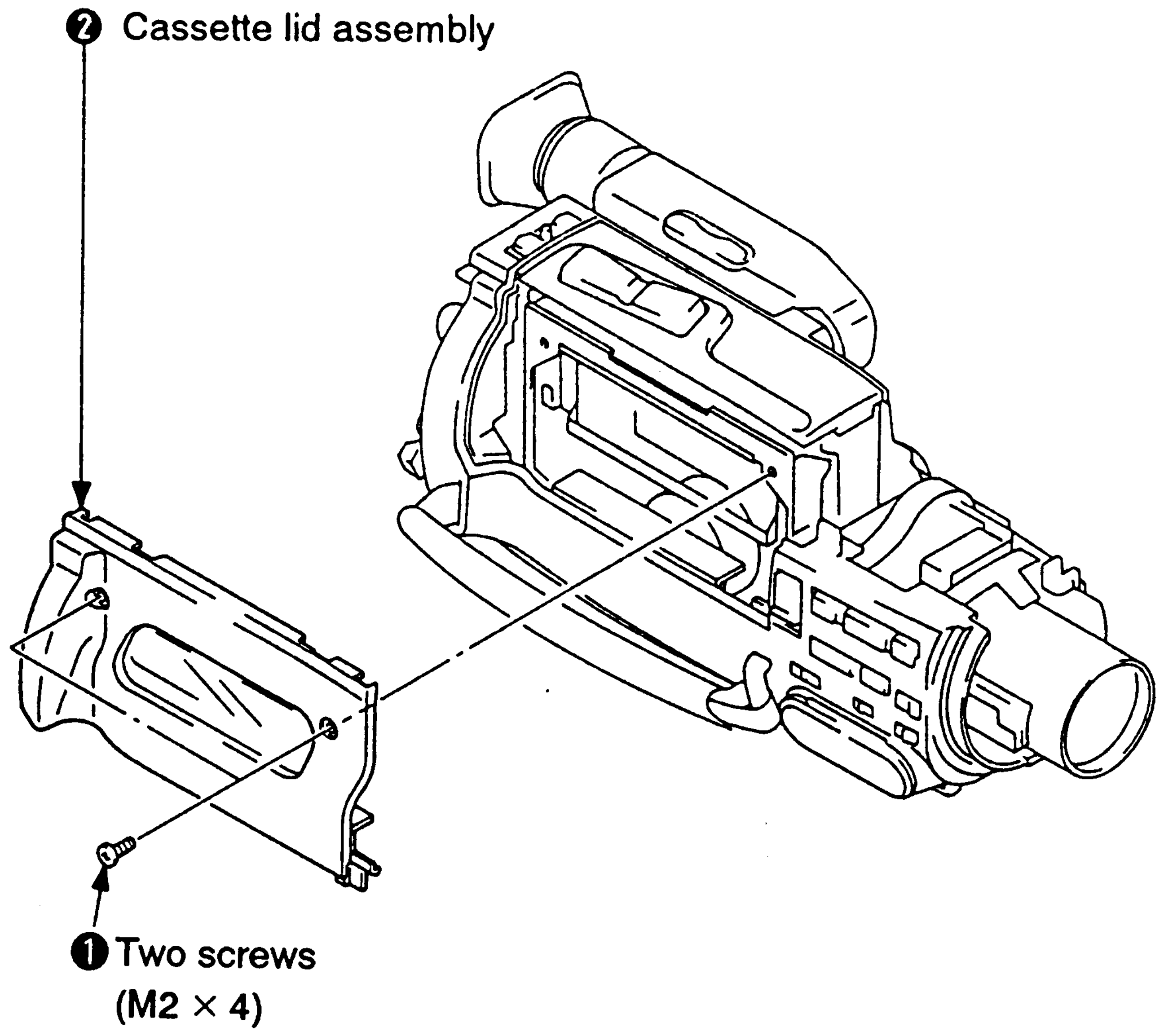
2-1. REMOVAL OF VARIABLE RESISTER


❶Two screws (M2 × 12)
❷ Accessory shoe
❺Connector
CN852 8P
CS-44 board
❹ Remove the variable resistor.
❸Screw (M2 × 4)

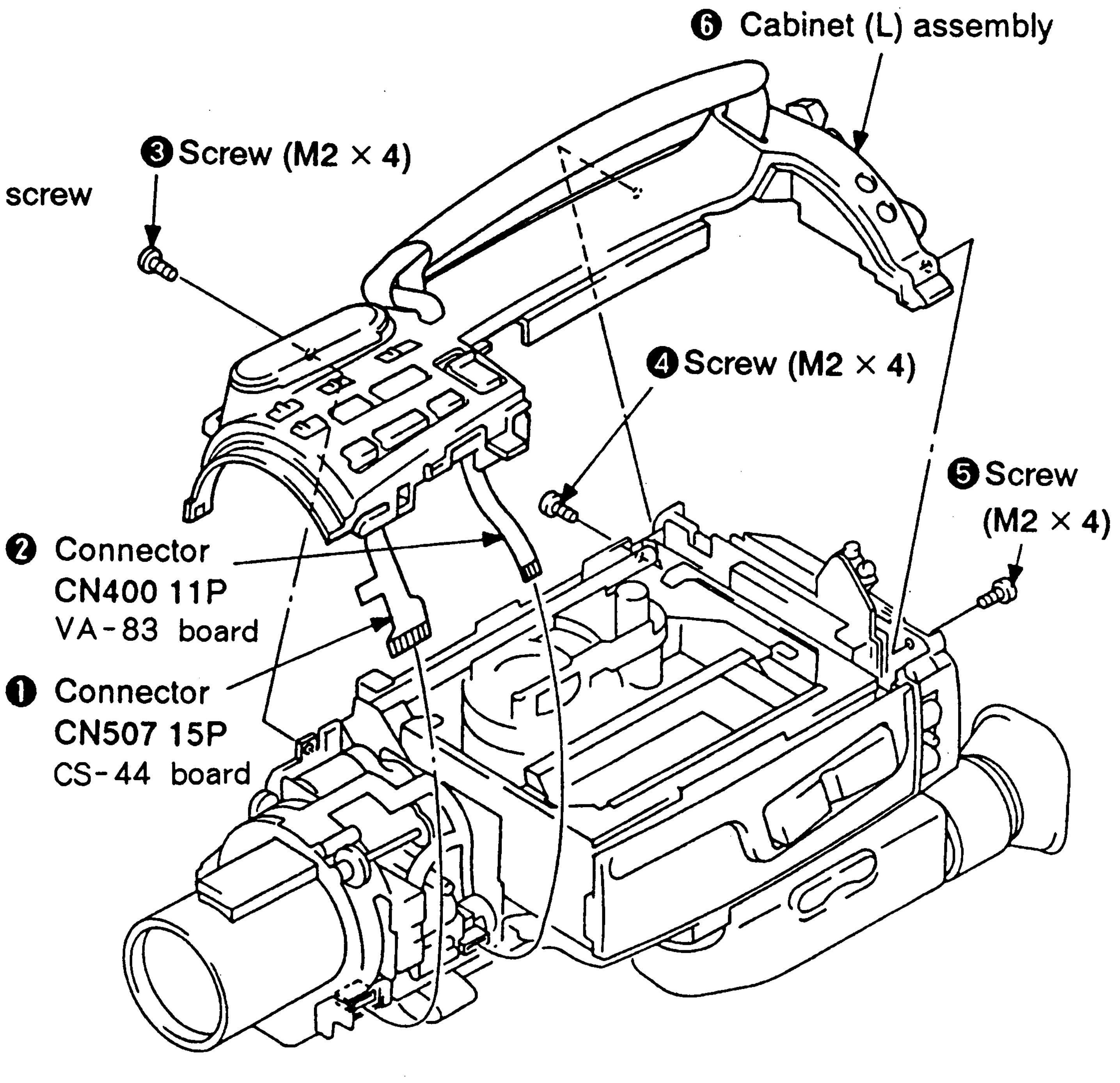
2-2. REMOVAL OF CABINET (UPPER) ASSEMBLY


❸ Remove the cabinet (upper) assembly in the arrow direction.
❷Screw(M2 × 4)
❹ Connector
CN751 9P
VK-30 board
❶Special head screw
(M2 × 4)

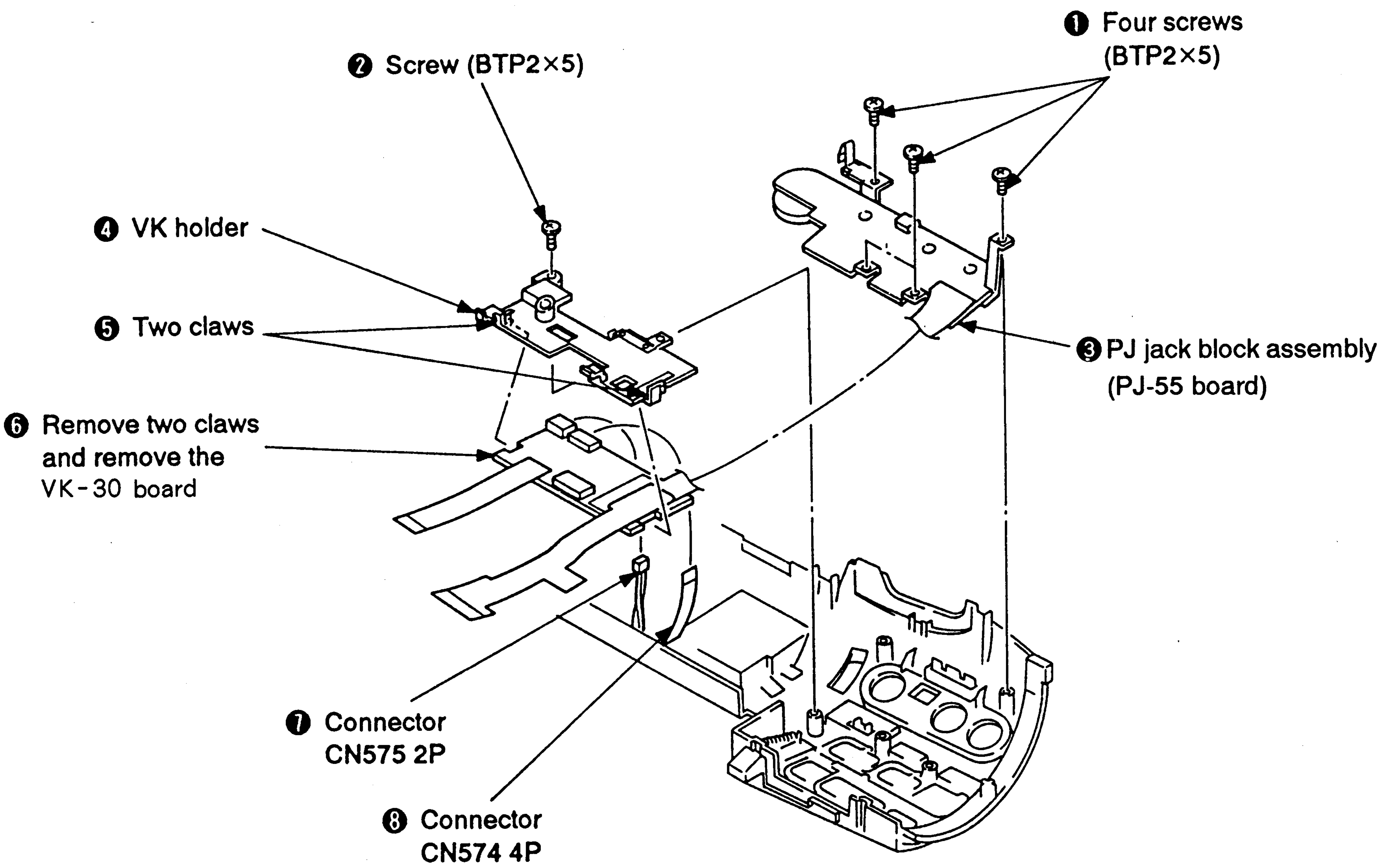
2-3. REMOVAL OF CASSETTE LID ASSEMBLY


❷ Cassette lid assembly
❶Two screws
(M2 × 4)

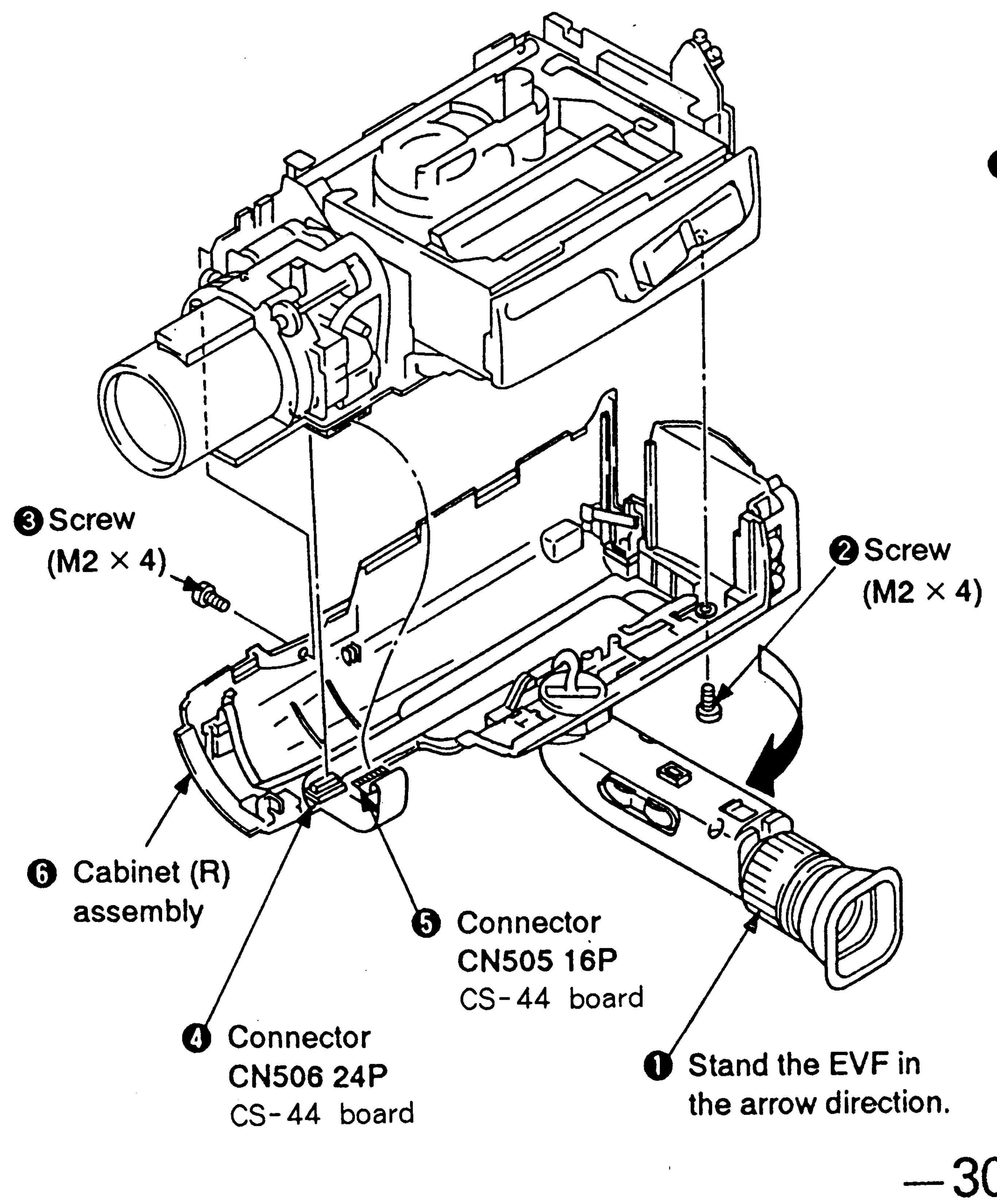
2-4. REMOVAL OF CABINET (L) ASSEMBLY


❻ Cabinet (L) assembly
❸Screw (M2 × 4)
❹Screw (M2 × 4)
❺Screw
(M2 × 4)
❷ Connector
CN400 11P
VA-83 board
❶ Connector
CN507 15P
CS-44 board

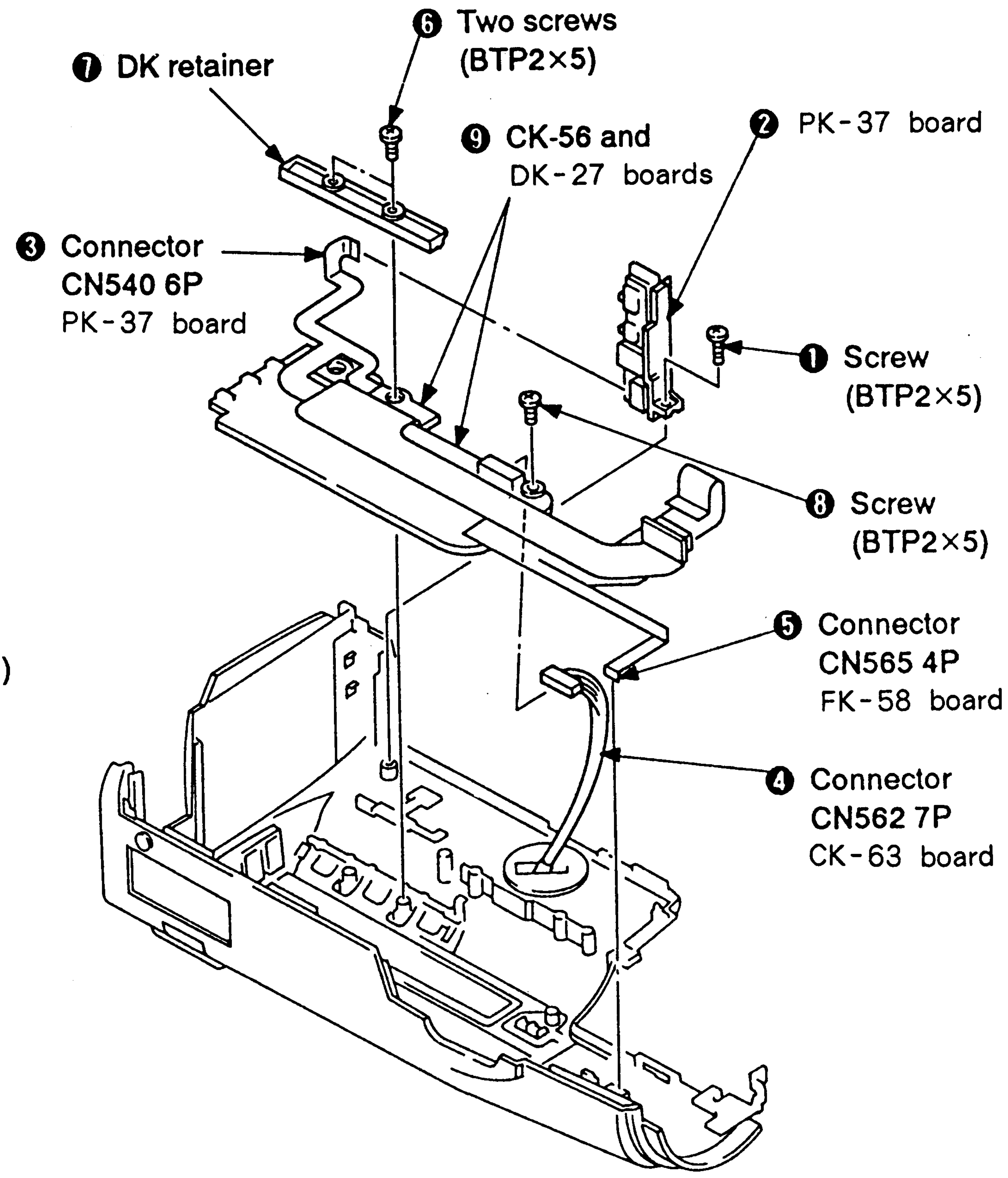
2-5. REMOVAL OF VK-30 AND PJ-55 BOARDS


❶ Four screws (BTP2×5)
❷ Screw (BTP2×5)
❸ PJ jack block assembly (PJ-55 board)
❹ VK holder
❺ Two claws
❻ Remove two claws and remove the VK-30 board
❼ Connector CN575 2P
❽ Connector CN574 4P

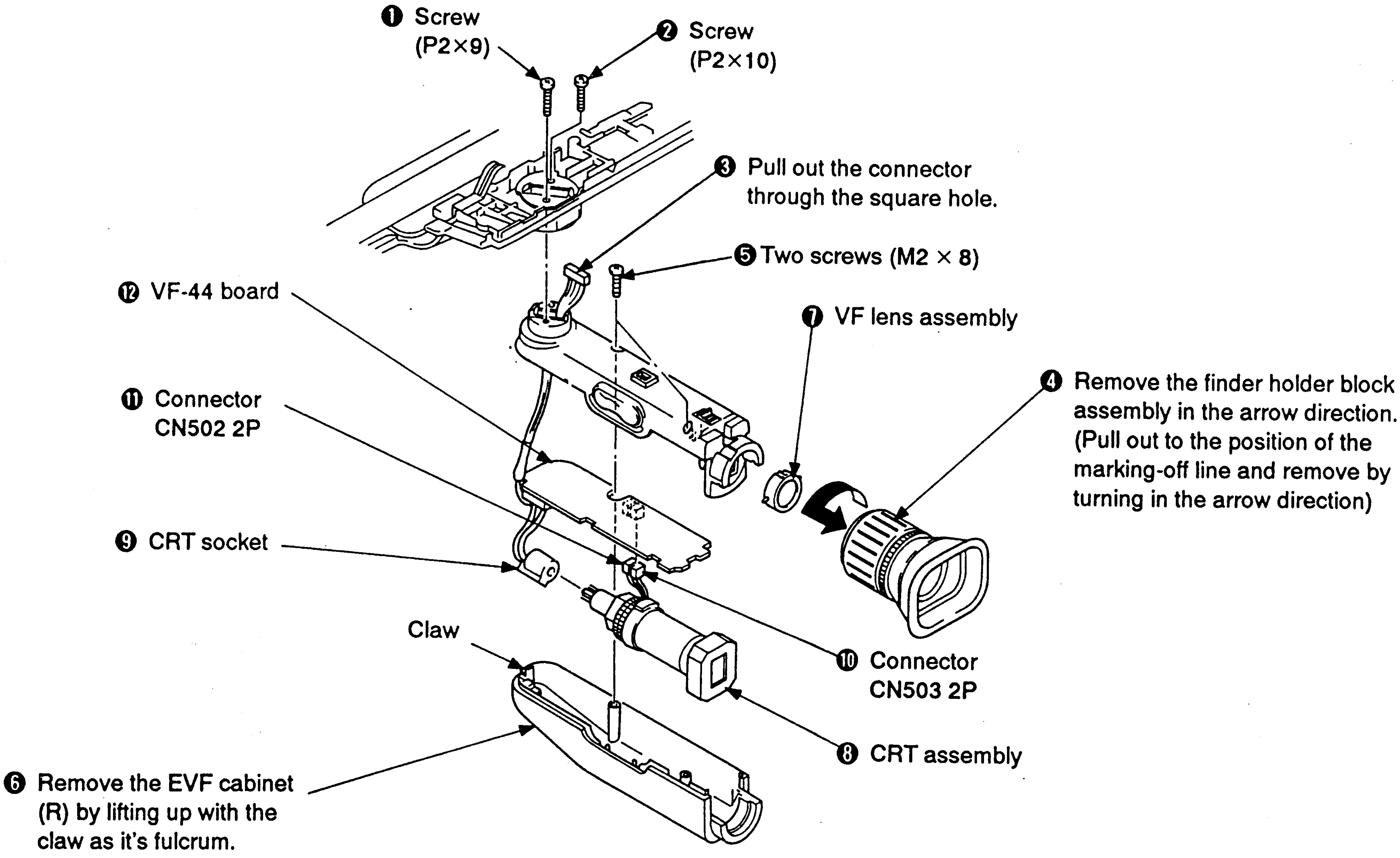
2-6. REMOVAL OF CABINET (R) ASSEMBLY


❸ Screw (M2 × 4)
❷ Screw (M2 × 4)
❻ Cabinet (R) assembly
❺ Connector CN505 16P CS-44 board
❹ Connector CN506 24P CS-44 board
❶ Stand the EVF in the arrow direction.

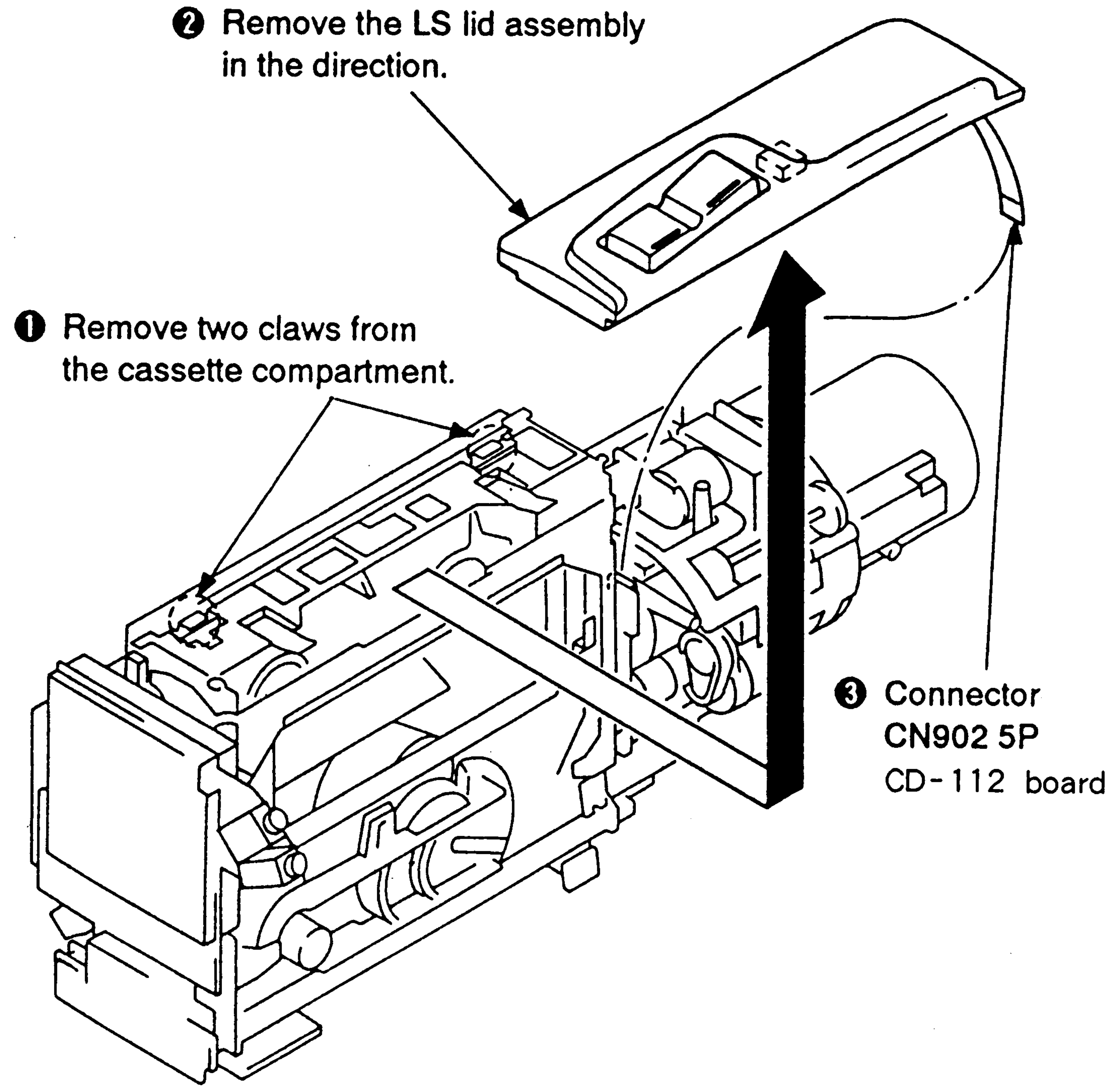
2-7. REMOVAL OF CK-63, DK-27 AND PK-37 BOARDS


❻ Two screws (BTP2×5)
❼ DK retainer
❾ CK-56 and DK-27 boards
❷ PK-37 board
❸ Connector CN540 6P PK-37 board
❶ Screw (BTP2×5)
❽ Screw (BTP2×5)
❺ Connector CN565 4P FK-58 board
❹ Connector CN562 7P CK-63 board

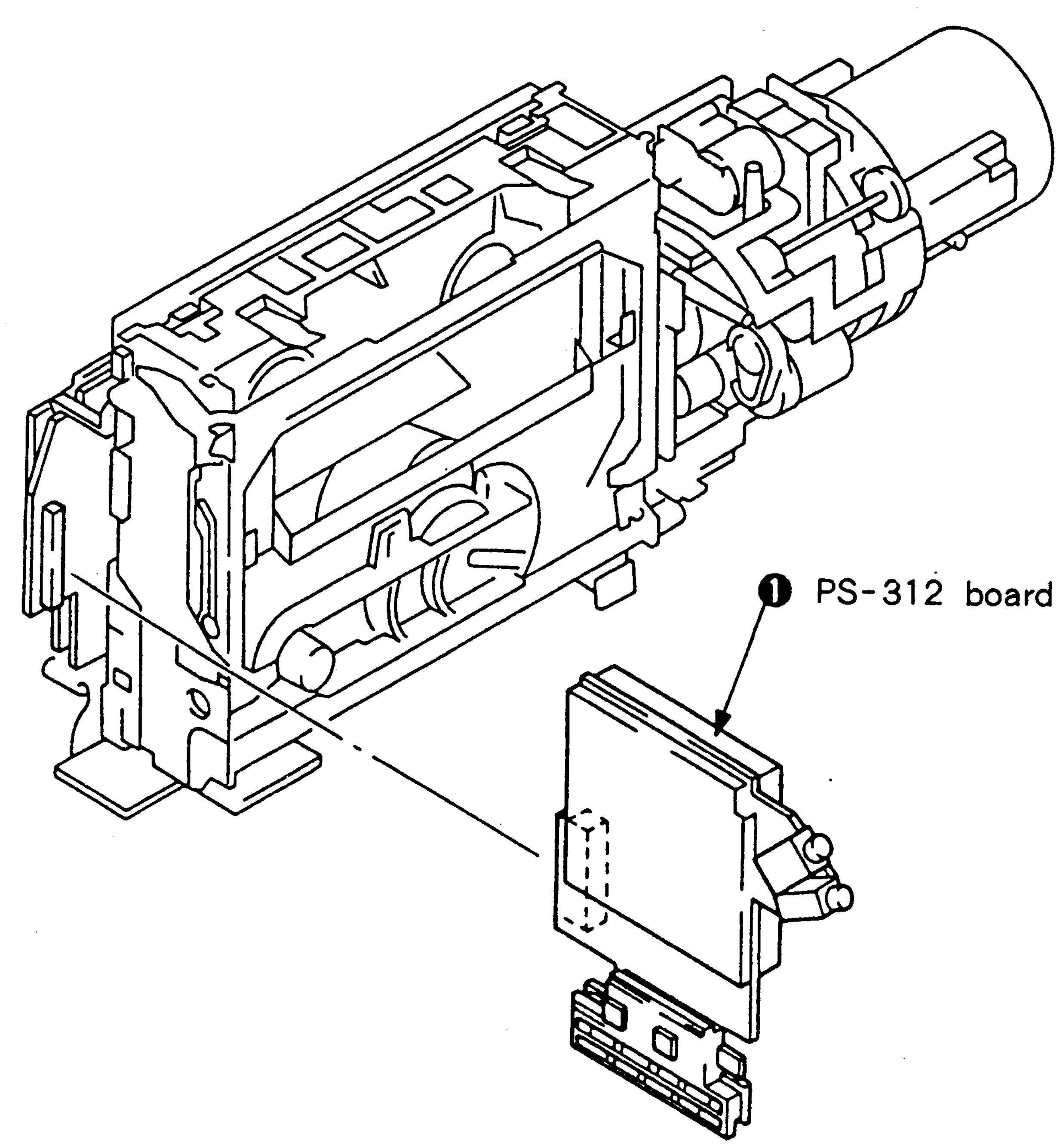
2-8. REMOVAL OF EVF ASSEMBLY (VF-44 BOARD)


① Screw (P2×9)
② Screw (P2×10)
③ Pull out the connector through the square hole.
⑤ Two screws (M2 × 8)
⑫ VF-44 board
⑦ VF lens assembly
⑪ Connector CN502 2P
④ Remove the finder holder block assembly in the arrow direction. (Pull out to the position of the marking-off line and remove by turning in the arrow direction)
⑨ CRT socket
Claw
⑩ Connector CN503 2P
⑧ CRT assembly
⑥ Remove the EVF cabinet (R) by lifting up with the claw as it's fulcrum.

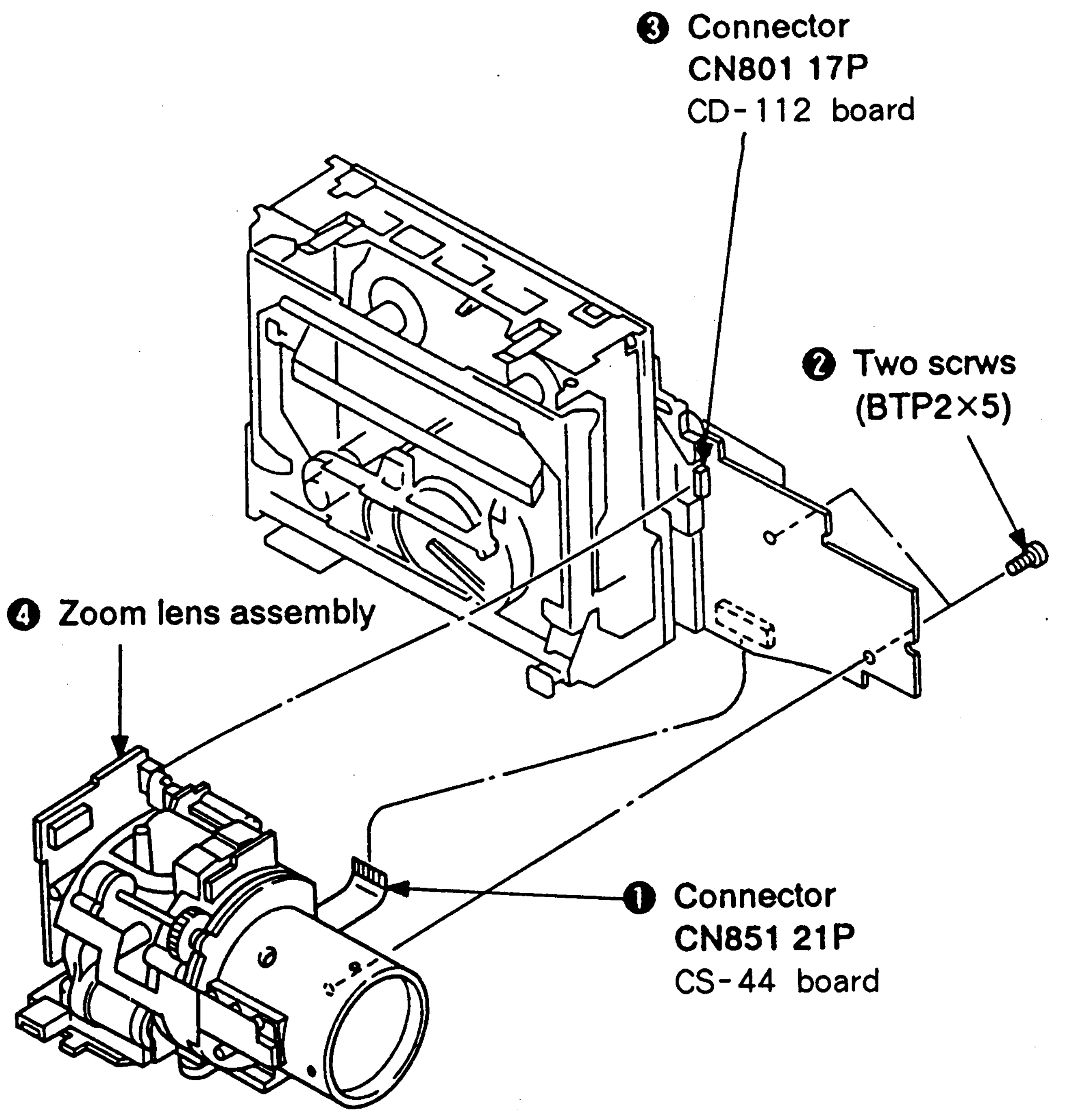
2-9. REMOVAL OF LS LID ASSEMBLY


② Remove the LS lid assembly in the direction.
① Remove two claws from the cassette compartment.
③ Connector CN902 5P
CD-112 board

2-10. REMOVAL OF PS-312 BOARD

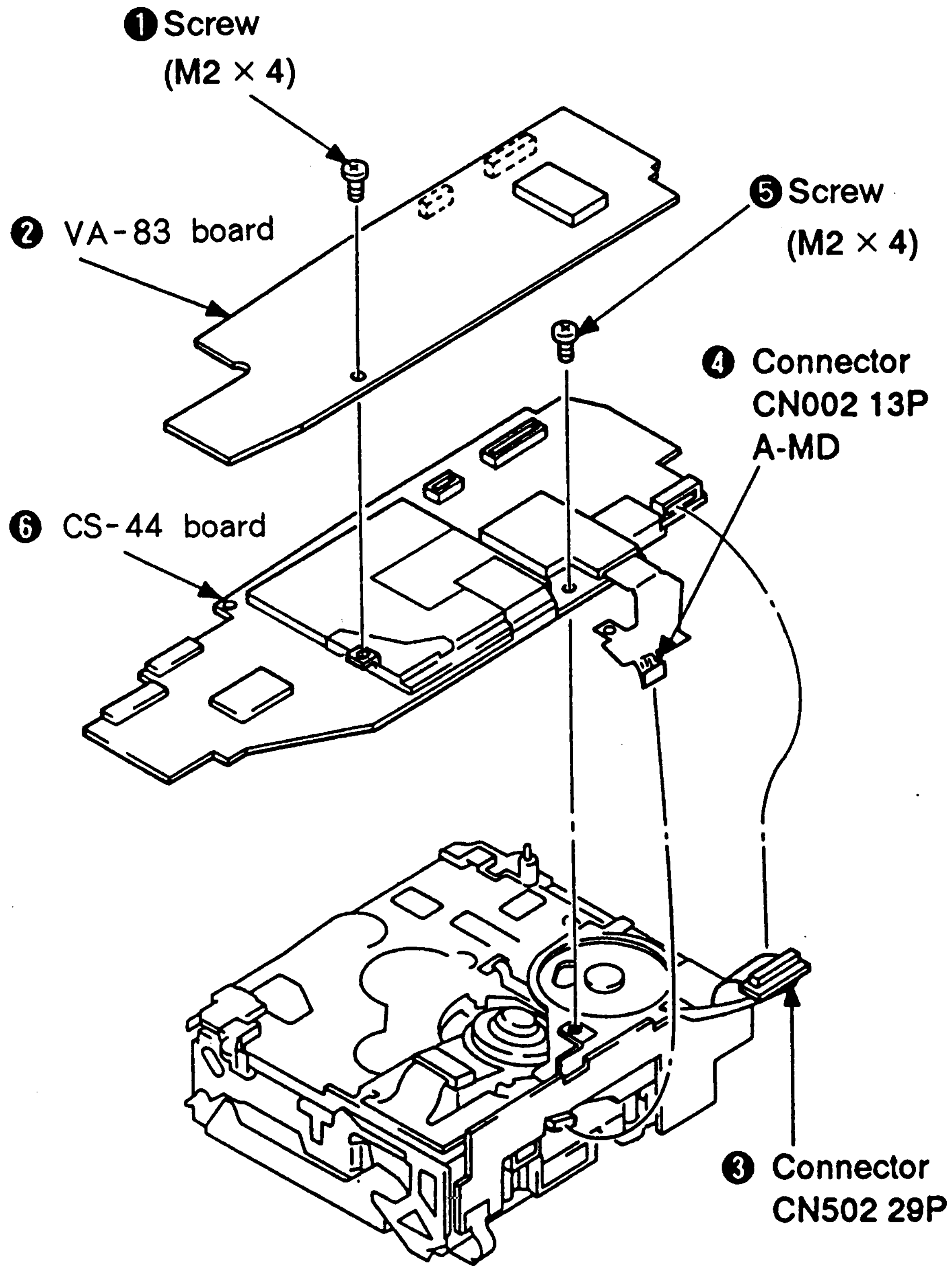

① PS-312 board

2-11. REMOVAL OF ZOOM LENS ASSEMBLY



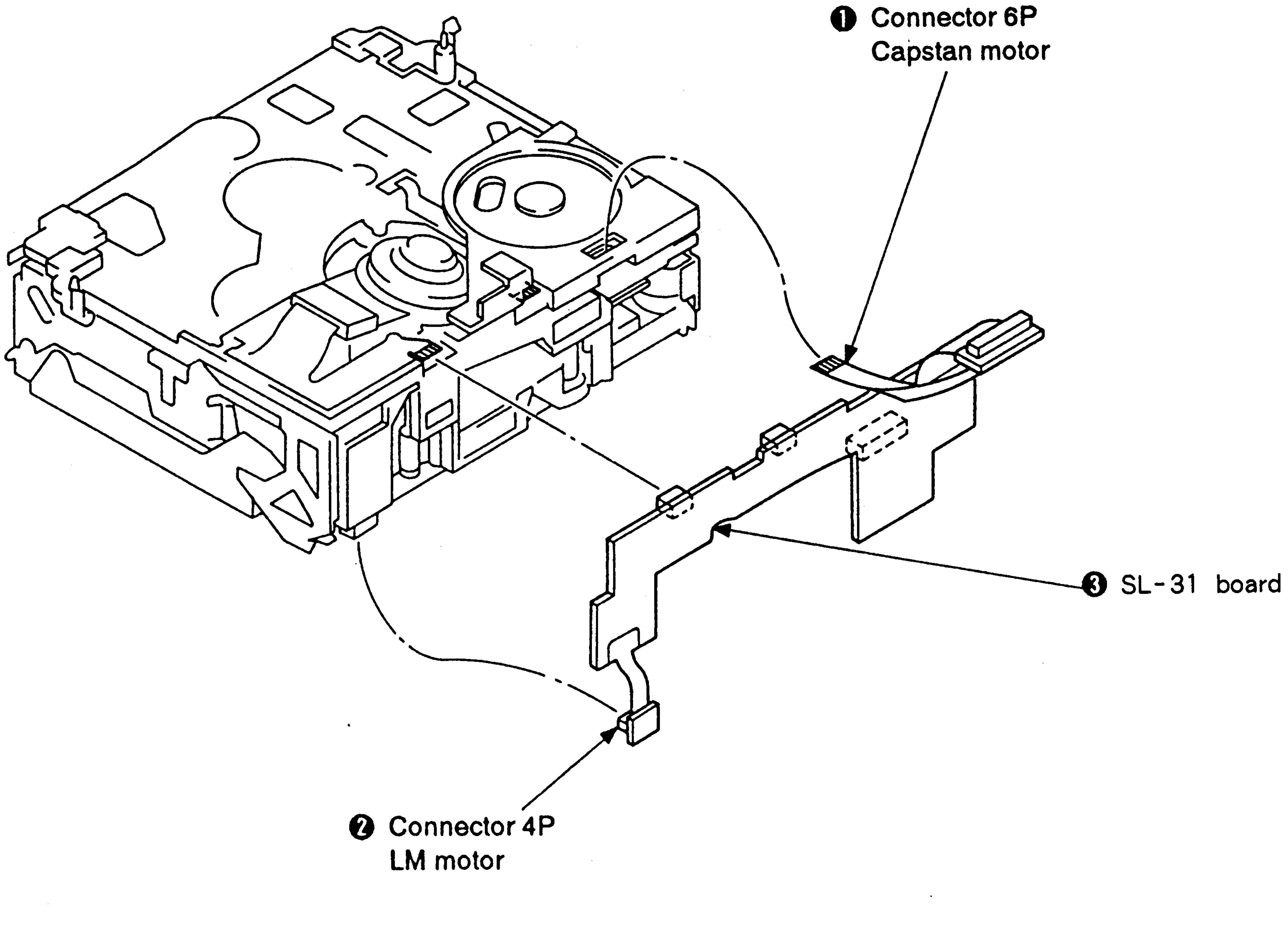
❸ Connector
CN801 17P
CD-112 board
❷ Two scrws
(BTP2×5)
❹ Zoom lens assembly
❶ Connector
CN851 21P
CS-44 board

2-12. REMOVAL OF VA-83 AND CS-35 BOARDS



❶ Screw
(M2 × 4)
❷ VA-83 board
❺ Screw
(M2 × 4)
❹ Connector
CN002 13P
A-MD
❻ CS-44 board
❸ Connector
CN502 29P

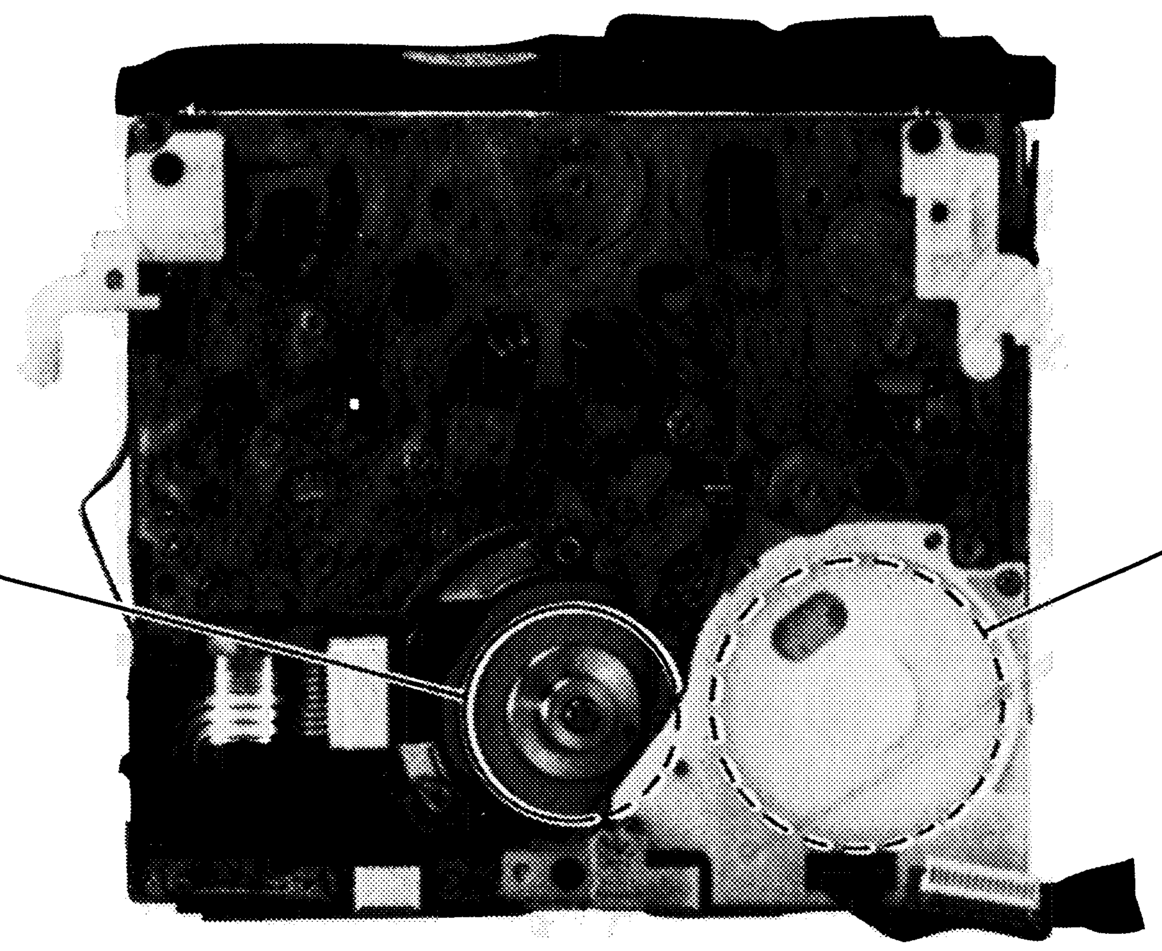
2-13. REMOVAL OF SL-31 BOARD



❶ Connector 6P
Capstan motor
❸ SL-31 board
❷ Connector 4P
LM motor

2-14. INTERNAL VIEWS

— Right side —

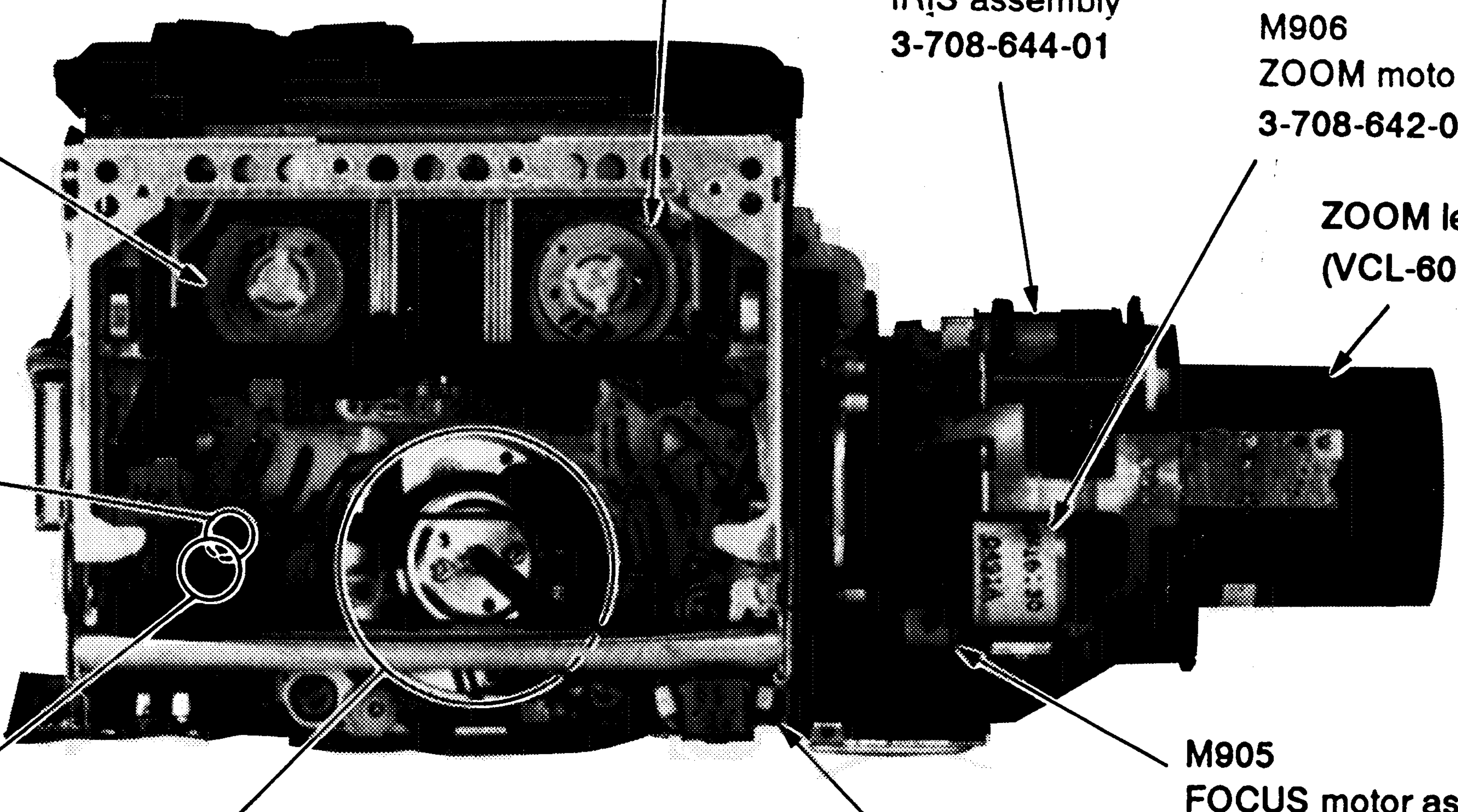


M901
Drum assembly
(DGH-78A-R)
A-7048-564-A

Upper drum assembly
(DGR-78-R)
A-7049-501-A

M902
Capstan motor
(SCE-0101A)
8-835-477-01

— Left side —



T reel table assembly
X-3941-274-1

S reel table assembly
X-3941-275-1

M904
IRIS assembly
3-708-644-01

M906
ZOOM motor assembly
3-708-642-01

ZOOM lens assembly
(VCL-6012WA) 1-547-606-11

Pinch roller

M902
Capstan motor
(SCE-0101A)
8-835-477-01

M901
Drum assembly (DGH-78A-R)
A-7048-564-A

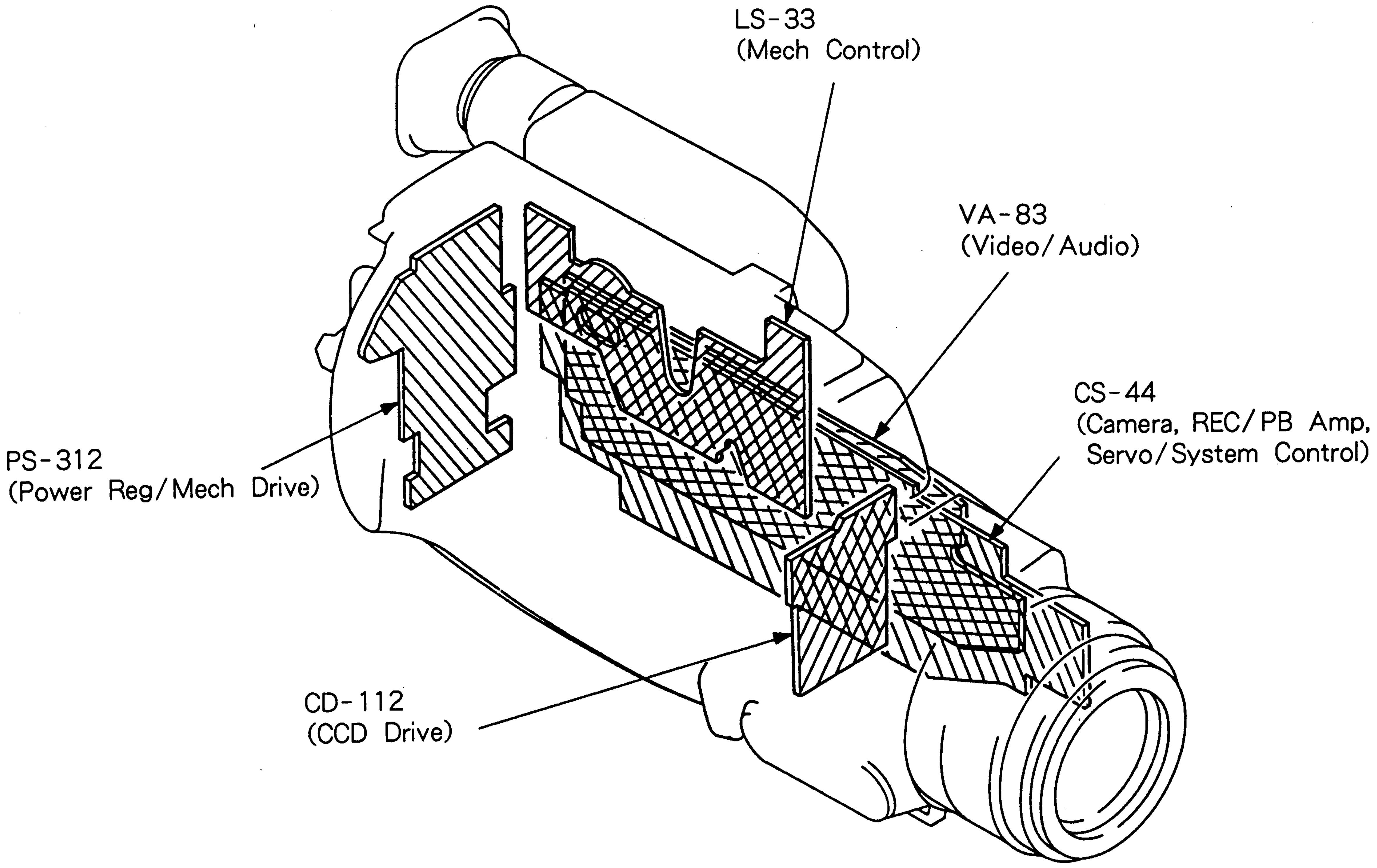
Upper drum assembly (DGR-78-R)
A-7049-501-A

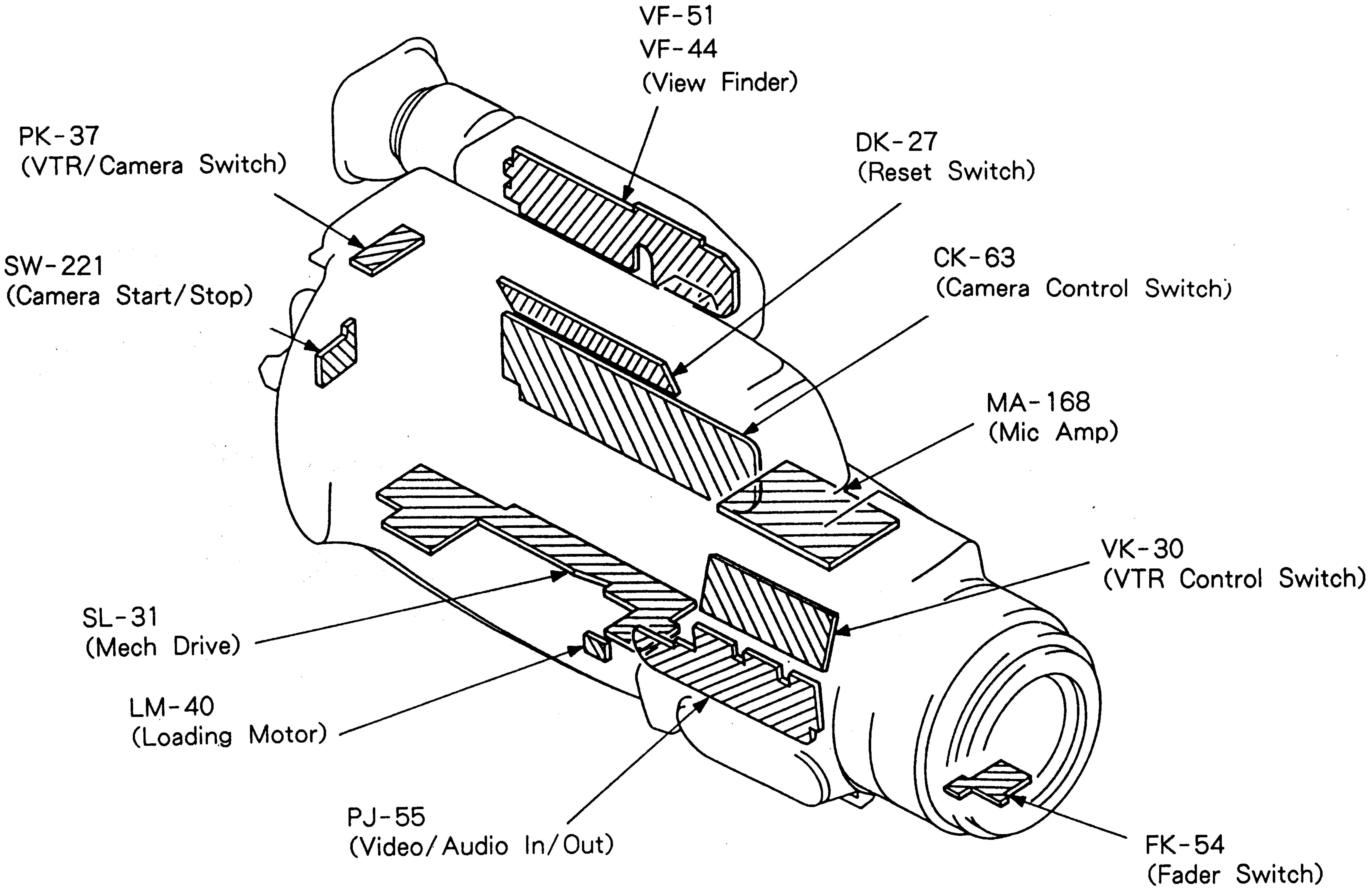
M903
Loading motor assembly
A-7040-304-A

M905
FOCUS motor assembly
3-708-612-01

SECTION 3
DIAGRAMS

3-1. CIRCUIT BOARD LOCATION


LS-33
(Mech Control)
VA-83
(Video/Audio)
CS-44
(Camera, REC/PB Amp, Servo/System Control)
PS-312
(Power Reg/Mech Drive)
CD-112
(CCD Drive)


VF-51
VF-44
(View Finder)
PK-37
(VTR/Camera Switch)
DK-27
(Reset Switch)
SW-221
(Camera Start/Stop)
CK-63
(Camera Control Switch)
MA-168
(Mic Amp)
VK-30
(VTR Control Switch)
SL-31
(Mech Drive)
LM-40
(Loading Motor)
PJ-55
(Video/Audio In/Out)
FK-54
(Fader Switch)

3-4. CAMERA MICROPROCESSOR PIN FUNCTION (IC709 on CS-44 Board:CXP80624)

Pin No.	Signal	I/O	Function
1	EPROM DI	O	Not used.
2	$\overline{\text{EPROM SCK}}$	O	
3	ZOOM M REV	O	Zoom motor control signal. Normally "H". 16.6 msec period PWM signal when rotating to WIDE.
4	ZOOM M FWD	O	Zoom motor control signal. Normally "H". 16.6 msec period PWM signal when rotating to TELE.
5	PB1		Not used.
6	PB0		
7	RT07/D7		
8	RT06/D6		
9	RT05/D5		
10	$\overline{\text{CORE RESET}}$	O	Camera core (IC707 on CS-44board) reset signal. Normally "H". "L" when reset.
11	PDR RESET	O	Focus predriver (IC706 on CS-44board) reset signal. Normally "H". "L" when reset.
12	TG STBY1		Not used.
13	TG STBY2		
14	$\overline{\text{OPD RESET}}$	O	OPD (IC705 on CS-44board) reset signal. "H": camera mode. "L": VTR mode.
15	PJ7/FSEL31		Not used.
16	PJ6/FSEL30		
17	PJ5/FSEL21		
18	PJ4/FSEL20		
19	PJ3/FSEL11		
20	PJ2/FSEL10		
21	PJ1/FSEL01		
22	PJ0/FSEL00		
23	EPROM DO	O	
24	$\overline{\text{EPROM BUSY}}$	I	BUSY signal from EEPROM. Normally "H". "L" pulse when data reading/writing.
25	FOC NEAR		Not used.
26	FOC FAR		
27	PD3/C	I	Fixed to +5V.
28	TA/$\overline{\text{CA}}$	I	
29	WIDE END		Fixed to +5V.
30	FOC END FAR	I	Focus end FAR sensor input. Normally "L".
31	$\overline{\text{CAM ON}}$	O	Power supply control signal. Normally "L".
32	PH6		Not used.
33	PH5		
34	PH4		
35	PH3		
36	PH2		
37	PH1		
38	FOC END LED	O	Focus end sensor LED control signal. Normally "H" (4.4V).
39	MP		Connected to GND.
40	$\overline{\text{CAM RESET}}$	I	Reset signal input. Normally "H". "L" when reset.
41	VSS		GND
42	XTAL	O	12 MHz clock oscillation circuit
43	EXTAL	I	
44	$\overline{\text{CS CAM}}$	I	Chip select signal from mode control microprocessor.
45	VTR SO	I	Serial data input from mode control microprocessor.
46	VTR SI	O	Serial data output from mode control microprocessor.
47	$\overline{\text{VTR SCK}}$	I	Serial data transfer clock
48	PF7/AN11		Not used.
49	PF6/AN10		
50	PF5/AN9		

Pin No.	Signal	I/O	Function
51	PF4		Not used.
52	AVSS		GND
53	AVREF		Analog input port reference voltage (5V)
54	AVDD		Analog input port voltage (5V)
55	PF3/AN7		Connected to GND.
56	PF2/AN6		V TEMP TERMINAL (Detecting external temperature from V. TEMP pin DC voltage.)
57	MAN FOCUS (2)	I	Manual focus input. 0 to 5 Vdc.
58	MAN FOCUS (1)	I	Manual focus input. 0 to 5 Vdc.
59	ZOOM SW	I	Zoom key input. 4.3V: F. TELE, 3.1V: TELE, 0.7V: F. WIDE, 1.9V: WIDE, 2.5V: no input.
60	ZOOM POS X4	I	Zoom position voltage. approx. 0V (WIDE end) to approx. 3V (TELE end).
61	HALL A/D	I	Hall voltage. approx. 1V (iris open) to approx. 3V (iris close).
62	ZOOM POSITION A/D	I	Zoom position voltage. approx. 0.2V (WIDE end) to approx. 2.4V (TELE end).
63	PG7/EX11		Connected to 5V.
64	PG6/EX10		
65	PG5/SYNC1		
66	VTR SYNC		
67	PB CTL		
68	DPG		
69	FOC FG		
70	AF BUSY	I	AF busy signal
71	PE7/DAB1		Not used
72	PE6/DAB0		
73	PE5/DAA1		
74	PE4/DAA0		
75	IRIS PWM	O	Iris control signal. 25.5 μsec period PWM signal
76	ZP PWM	O	Zoom position detection voltage output. 25.5 μsec period PWM signal
77	AJST	I	Adjustment timing pulse input. Normally "H".
78	VD	I	VD signal input from sync generator
79	CAM SI	I	Serial data input
80	CAM SO	O	Serial data output
81	$\overline{\text{CAM SCK}}$	O	Serial data transfer clock
82	$\overline{\text{CS CAM}}$		Not used
83	PI/TO		
84	PI/PWM		
85	PI/PO		
86	PI O		Connected to +5V.
87	PKO		
88	GND		GND
89	VDD		+5V power supply
90	VPP		
91	PA7/A15		Not used.
92	$\overline{\text{CS PDR}}$	O	Chip select signal to focus predriver (IC706 on CS-44 board)
93	$\overline{\text{CS CAM D/A}}$	O	Chip select signal to camera EVR (IC702 on CS-44 board)
94	$\overline{\text{CS ROM}}$	O	Chip select signal to EEPROM (IC712 on CS-44 board)
95	$\overline{\text{CS OPD}}$	O	Chip select signal to OPD (IC705 on CS-44 board)
96	$\overline{\text{NTSC}}$	O	NTSC: "L", PAL: "H"
97	$\overline{\text{CS CORE}}$	O	Chip select signal to camera core (IC707 on CS-44 board)
98	$\overline{\text{CS TG}}$	O	Select signal to timing generator (IC801 on CS-44 board)
99	J STB		Not used
100	PB6		

3-10. MECHANISM CONTROL MICROPROCESSER PIN FUNCTION (IC503 ON CS-44 BOARD:CXP80624)

Pin No.	Port Name	Signal	I/O	Connection	Function
1	11	CAP ON	O	MD	Capstan driver ON/OFF control signal. "H" when capstan ON.
2	PB4/PP012	CAP FWD/$\overline{\text{RVS}}$	O	MD	Capstan rotating direction control signal. "H": FWD, "L": RVS.
3	PB3/PP011	RP PB MODE	O	RP	REC/PB select signal of REC/PB amplifier (IC001 on CS-44board) and ATF servo IC (IC501 on CS-44board). "H": PB.
4	PB2/PP010	$\overline{\text{FE ON}}$	O	RP	Flying erase oscillation ON/OFF control signal. "L": oscillation.
5	PB1/PP09	JOG VD	O	VA	False VD signal to be inserted into playback video signal during variable speed playback.
6	PB0/PP08	JOG	O	VA	Variable speed/normal speed playback select signal of video circuit. "H" when variable speed playback.
7	PC7/RT07	JACK $\overline{\text{IN}}$/OUT DET	I	VA	Jack in/out switch input. "L" when input.
8	PC6/RT06	1.7M DET	I	VA	Normal/stereo discrimination input. "H" when AFM stereo tape playback.
9	PC5/RT05	JACK MONO/$\overline{\text{STE}}$ DET	I	VA	AUDIO IN/OUT jack monaural/stereo discrimination input. "H": monaural (No jack inserted in right terminal)
10	PC4/RT04	INT VD	I		Not used.
11	PC3/RT03	PB V (SYSTEM SYNC)	O	MODE CON	V sync for mode controller.
12	PC2/RT018	$\overline{\text{SYNC DET OUT}}$	O	VA	Sync detect output. "L" when Sync is detected.
13	PC1/RT017	E/$\overline{\text{L}}$ DET	I	VA	Not used.
14	PC0/RT016	MIC $\overline{\text{MONO}}$	I	AU	External microphone monaural/stereo discrimination input. "L" when monaural microphone used.
15	PJ7	M SW 0	I	MD	Mode switch input.
16	PJ6	M SW 1	I	MD	
17	PJ5	M SW 2	I	MD	

	BL	END	EJECT	USE	LOAD	READY	TURN	REC/PB	FF
M SW 0	L	L	L	H	L	H	H	L	L
M SW 1	L	H	L	L	L	L	H	H	L
M SW 2	L	H	H	H	H	L	L	L	L

Pin No.	Port Name	Signal	I/O	Connection	Function
18	PJ4	$\overline{\text{CC DOWN}}$	I	MD	Cassette compartment down switch input. "L": down.
19	PJ3	$\overline{\text{REC PROOF}}$	I	MD	Erasure protection switch input. "L" when REC prohibit.
20	PJ2	ME/$\overline{\text{MP}}$	I	MD	ME/MP switch input. "L": MP, "H": ME.
21	PJ1	HG/$\overline{\text{NOR}}$	I	MD	Connected to GND.
22	PJ0	VIDEO MUTE	O	VA	Video output mute signal. "H": mute.
23	PD7	LINE MIX	I	VA	AUDIO OUT monaural/stereo select signal. "H": monaural.
24	PD6	MX SEL 1	I	VA	Matrix select signal.
25	PD5	MX SEL 2	I	VA	

	STEREO	MAIN	SUB
MX SEL 1	L	L	H
MX SEL 2	L	H	L

Pin No.	Port Name	Signal	I/O	Connection	Function
26	PD4	MX ON/$\overline{\text{OFF}}$	O	VA	Matrix ON/OFF signal. "H" when matrix on (stereo).
27	PD3	E MODE	O	VA	Not used.
28	PD2	CAM/$\overline{\text{LINE}}$	O	VA	Camera input/line input select signal. "H" when camera input.
29	PD1	DS ON	O	VA	Data screen ON/OFF signal. "H": ON.
30	PD0	$\overline{\text{EDIT}}$	O	VA	Video circuit EDIT/NORMAL switch signal. "L": EDIT.
31	PH7	UNLOAD	O	SS	Loading motor control signal. "H" or "H" pulse when unloading.
32	PH6	LOAD	O	SS	Loading motor control signal. "H" or "H" pulse when loading.
33	PH5	$\overline{\text{LM LIM COM}}$	O	SS	Loading motor limiter control signal. Temporary "H" when loading.
34	PH4	COMP REC	O	VA	Not used.
35	PH3	DRUM REV	O	SS	Drum rotating control signal . Normally "L".
36	PH2		O		N.C.
37	PH1		O		
38	PH0	$\overline{\text{REEL HALL CONT}}$	O	SS	Not used.
39	MP	MP			Connected to GND.
40	RST	$\overline{\text{RESET}}$	I	MODE CON	Reset signal from mode control microprocessor. "L" when reset.
41	VSS	VSS			GND
42	XTAL	XTAL	I	SS	11.89 MHz clock oscillation circuit.
43	EXTAL	EXTAL	O	SS	

Pin No.	Port Name	Signal	I/O	Connection	Function
44	CSO	$\overline{\text{COSMO CS}}$	I	MODE CON	Chip select signal from mode control microprocessor (CS-44board IC506)
45	S10	DATA TO SLVE	I	MODE CON	Serial data input from mode control microprocessor.
46	S00	DATA TO MSTR	O	MODE CON	Serial data output to mode control microprocessor.
47	SCKO	SCK	I	MODE CON	Serial clock input from mode control microprocessor.
48	PF7/AN11	AUDIO MUTE	O	VA	Audio output mute signal. "H": mute.
49	PF6/AN10	1.7M OFF	O	VA	1.7 MHz REC AFM carrier ON/OFF signal. "H": OFF (monaural recording).
50	PF5/AN9	GND	I		GND
51	PF4/AN8	GND	I		
52	AVSS	AVSS			Analog port GND.
53	AVREF	AVREF			Analog port reference voltage. Connected to +5V.
54	AVDD	VDD			Analog port power supply (5V).
55	PF3/AN7	N.C.			Connected to GND.
56	PF2/AN6	END SENS	I	SS	Tape end detection signal. Normally "L", "H" pulse: tape end.
57	PF1/AN5	TOP SENS	I	SS	Tape top detection signal. Normally "L", "H" pulse: tape top.
58	PF0/AN4	DEW	I	SS	Dew condensation detection signal. "L" when dew condensation.
59	AN3	BATT SENSE	I	SS	Battery voltage input for battery end detection. 1/2 divided by RB504.
60	AN2	ATF ERROR	I	SS	ATF error, ATF lock error input.
61	AN1	S REEL FG	I	SS	S reel FG signal input.
62	AN0	T REEL FG	I	SS	T reel FG signal input.
63	PG7/EXI1	PG7 (N.C.)			Connected to GND.
64	PG6/EXI0	CAM VD	I	CAM SG	VD signal from camera circuit sync generator. V period pulse.
65	PG5/SYNC1	FLD	I	CAM SG	FIELD signal from camera circuit sync generator. 2V period pulse.
66	PG4/SYNC0	VTR SYNC	I	VA	Composite sync signal separated from REC/PB Y signal.
67	PG3/PBCTL	PB SP LP	I	SS	Discriminates PB tape REC mode when CUE/REVIEW/FF and REW. "L": LP.
68	PG2/DPG	DRUM PG	I	SS	Drum PG signal input. For drum phase servo 33.3 msec period "H" pulse.
69	PG1/DFG	DRUM FG	I	SS	Drum FG signal input. For drum speed servo 2.8 msec period pulse.
70	PG0/CFG	CAP FG	I	MD	Capstan FG signal input. For capstan speed servo. Approx. 994 Hz when REC/PB (SP).
71	PE7/DAB0	N.C.	O		N.C.
72	PE6/DAB0	T/E LED ON	O	SS	Tape LED ON/OFF signal. 100 msec period "H" pulse when REC/PB.
73	PE5/DAA1	N.C.	O		N.C.
74	PE4/DAA0	N.C.	O		
75	PE3/PWM1	CAP PWM	O	SS	Capstan error signal output 20.15 μsec PWM signal.
76	PE2/PWM0	DRUM PWM	O	SS	Drum error signal output 20.15 μsec PWM signal.
77	PE1/EC/INT2	C FG	I	MD	Capstan FG signal input. For tape counter.
78	PE0/INT0	$\overline{\text{S JACK IN}}$			Not used, connected to +5V.
79	P17/ST1	LANC IN	I	SS	Control L serial data input.
80	P16/SO1	LANC OUT	O	SS	Control L serial data output.
81	P15/SCK1	LIMIT CONT (1)	I	SS	Loading motor limiter ON detection signal. Normally "H", "L" when limiter ON.
82	P14/INT1	AGC SLOW			Not used.
83	P13/TO	DRUM ON	O	SS	Drum driver ON/OFF control signal. "H" when drum ON.
84	P12/PWM	CLOG	O	SS	Head clog detection signal. "L" when no trouble.
85	P11/PO	REF PILOT	O	SS	ATF servo reference pilot signal. Synchronized when drum rotation to output by selecting four frequencies. f1=102.52 kHz, f2=118.95 kHz, f3=165.21 kHz and f4=148.69 kHz.

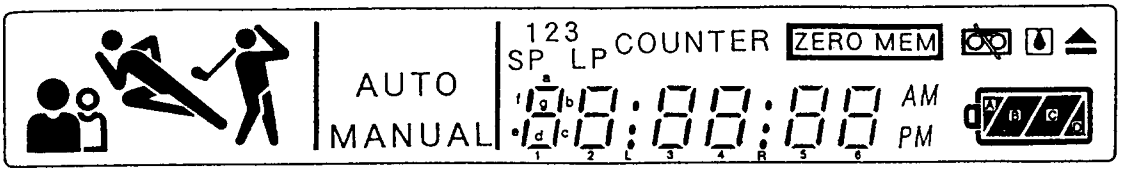
Pin No.	Port Name	Signal	I/O	Connection	Function
86	P10/PO				Connected to +5V.
87	PKO	13/10 SW	I	MD	Connected to GND.
88	VSS	VSS			GND
89	VDD	VDD			VDD
90	N.C.	(VPP)			Connected to +5V.
91	PA7/PP07	DRUM ACC	O	SS	Drum motor acceleration signal. Normally "L". "H" pulse when SLOW mode.
92	PA6/PP06	DRUM BRK	O	SS	Drum motor brake signal. Normally "L".
93	PA5/PP05	SP/$\overline{\text{LP}}$	O	VA	SP/LP select signal. "L": LP.
94	PA4/PP04	AU IN/OUT	O		N.C.
95	PA3/PP03	O SW	O	VA	VIDEO OUT inhibit signal. "H": inhibit.
96	PA2/PP02	I SW	O	VA	VIDEO IN/OUT select signal. "L": VIDEO IN.
97	PA1/PP01	VA PB MODE	O	ALL	Video/audio circuit REC/PB select signal. "H": PB.
98	PA0/PP00	VI SWP	O	VA	RF switching pulse signal for video circuit. 30 Hz, 50% duty pulse.
99	PB7/PP015	RF SWP	O	ALL	RF switching pulse signal for REC/PB amp and Audio circuit. 30 Hz, 50% duty pulse.
100	0	H CHG	O	VA	Not used.

3-11. MODE CONTROL MICROPROCESSER PIN FUNCTION(IC506 ON CS-44 BOARD: µ PD75316)

Pin No.	Port Name	Signal	I/O	Connection	Function
1	S12	S12	O		Segment terminal drive signal to LCD. (Four value output of 0, 1.7, 3.3, 5V)
2	S13	S13	O		
3	S14	S14	O		
4	S15	S15	O		
5	S16	S16	O		
6	S17	S17	O		
7	S18	S18	O		
8	S19	S19	O		
9	S20	S20	O		
10	S21	S21	O		
11	S22	S22	O		
12	S23	S23	O		Not used.
13	S24/BP0	$\overline{\text{EEPROM CS}}$	O		Chip select signal to EEPROM (IC511 on CS-44 board). 1/2V period "L" pulse.
14	S25/BP1	TG STBY 1	O	CAM	Power save control signal to timing generator (IC801 on CS-44 board). Normally "L".
15	S26/BP2	AUDIO IN/$\overline{\text{OUT}}$	O	AU	Audio input/output control signal. "H": input. "L": output.
16	S27/BP3		O		N.C.
17	S28/BP4	TITLE CS	O	CAM	Chip select signal to DISPLAY CONTROLLER (IC711 on CS-44 board).
18	S29/BP5	REMO CS	O		Chip select signal to sircs remote controller (IC509 on CS-44 board). 1V period "L" pulse.
19	S30/BP6	S RAM CS	O		Chip select signal to S RAM (IC710 on CS-44 board). "H" when using title. Normally, "L".
20	S31/BP7	$\overline{\text{CAM COSM CS}}$	O	CAM	Chip select signal to camera controller (IC709 on CS-44 board). 1V period "L" pulse.
21	COM0	COM 0	O		Common terminal drive signal to LCD. (Four value output of 0, 1.7, 3.3, 5V)
22	COM1	COM 1	O		
23	COM2	COM 2	O		
24	COM3	COM 3	O		
25	BIAS	BIAS	O		Bias voltage output for voltage deviding resistor.
26	VLC0	VCC 0	I		Power source 0 input Power source for LCD drive.
27	VLC1	VCC 1	I		Power source 1 input
28	VLC2	VCC 2	I		Power source 2 input
29	P40	K OUT 4	O	all	KEY matrix output. 1V period "L" pulse output when corresponding key is pressed. "L" when other cases.
30	P41	K OUT 5	O	all	
31	P42	$\overline{\text{SYS RESET}}$	O	all	Output signal to reset each IC when power is turned on. Normally "H".
32	P43	$\overline{\text{TALLY}}$	O	EVF	Tally LED ON/OFF signal. "L": ON.
33	VSS	VSS			GND
34	P50	K OUT 0	O	all	KEY matrix output. 1V period "L" pulse output when corresponding key is pressed. "L" when other cases.
35	P51	K OUT 1	O	all	
36	P52	K OUT 2	O	all	
37	P53	K OUT 3	O	all	
38	P00/INT4	$\overline{\text{BATT IN}}$	I		Clock select to 32 kHz when "L" and to 4.19 MHz with "H" when Battery is turned on. "L" is select.
39	P01/$\overline{\text{SCK}}$	SCK	O	all	Serial clock output terminal, Serial clock (2 µS) communication.
40	P02/SO/SB0	DATA TO SLVE	O	all	Serial bus output terminal, Serial clock (2 µS) communication.
41	P03/SI/SB1	DATA TO MSTR	I	all	Serial bus input terminal, Serial clock (2 µS) communication.

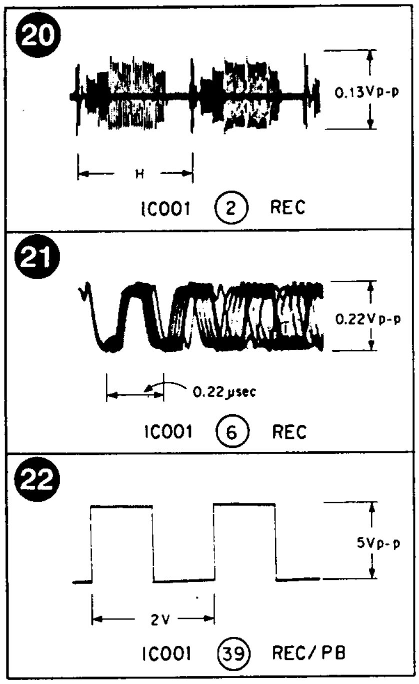
Pin No.	Port Name	Signal	I/O	Connection	Function
42	P10/INT0	SYSTEM SYNC	I	all	(Edge detection vector interruption), System synchronization input port from CXP80624 (IC503 on CS-44 board).
43	P11/INT1	$\overline{\text{LI PRE END}}$	I		(Edge detection vector interruption), Lithium PRE END is selected with "L".
44	P12/INT2	$\overline{\text{LANC PWR ON}}$	I		Power on signal input from wired remote control. "L" when power switch pressed.
45	P13/TIO	TITLE BUSY	I	CAM	Busy signal from DISPLAY CONTROLLER (IC711 on CS-44 board).
46	P20/PT00	VTR ON	O	PS	VTR power source (SS5V, VIDEO 5V, AUDIO 5V, EVF 5V, D5V, D4V) control signal. "H" when power switch is in "VTR" or "CAMERA" position.
47	P21	CAM ON	O	PS	CAMERA power source (CAM 5V, +15V, -9V) control signal. "H" when power switch is in "CAMERA" position.
48	P22/PCL	$\overline{\text{VIDEO D/A CS}}$	O	VA	Serial data load signal to video circuit EVR (IC203, 204 on VA-83 board). 1V period "H" pulse.
49	P23/BUZ	BUZ	O		Buzzer output. Normally "L". 2 kHz pulse: alarm.
50	P30/LCDCL	$\overline{\text{VIDEO CS}}$	O	VA	Chip select signal to Y process IC (IC201 on VA-83 board). 1V period "L" pulse.
51	P31/SYNC	$\overline{\text{VTR COSM CS}}$	O		Chip select signal to mechanism controller (IC503 on CS-44 board). 1V period "L" pulse.
52	P32	$\overline{\text{SG CS}}$	O	CAM	Chip select signal to sync generator (IC704 on CS-44 board). 1V period "L" pulse.
53	P33	$\overline{\text{CRTC CS}}$	O	CAM	Strobe signal for character generator (IC703 on CS-44 board). 1V period "H" pulse.
54	VDD	VDD			VDD
55	XT1	XT1	I		SUB system clock. 32 kHz oscillation terminal.
56	XT2	XT2			
57	N.C.	N.C.			Connected to +5V.
58	X1	X1	I		Main system clock. 4.19 MHz oscillation terminal.
59	X2	X2	I		
60	P60/KK0	K IN 0	I	all	KEY matrix input. 1V period "L" pulse input when corresponding key is pressed. "H" when other case.
61	P61/KR1	K IN 1	I	all	
62	P62/KR2	K IN 2	I	all	
63	P63/KR3	K IN 3	I	all	
64	P70/KR4	K IN 4	I	all	
65	P71/KP5	K IN 5	I	all	
66	P72/KP6	K IN 6	I	all	
67	P73/KP7	$\overline{\text{CC DOWN}}$	I	MD	Cassette compartment lock switch input. "L": Lock.
68	$\overline{\text{RESET}}$	$\overline{\text{RESET}}$	I		System reset input. "L": Reset, Normally: "H".
69	S0	CLK CHK	O		Clock (32 kHz) output terminal for check.
70	S1	S1	O		Not used.
71	S2	S2	O		
72	S3	S3	O		Segment terminal drive signal to LCD. (Four value output of 0, 1.7, 3.3, 5V)
73	S4	S4	O		
74	S5	S5	O		
75	S6	S6	O		
76	S7	S7	O		
77	S8	S8	O		
78	S9	S9	O		
79	S10	S10	O		
80	S11	S11	O		

LCD Port Layout


AUTO
MANUAL
123
SP LP
COUNTER
ZERO MEM
AM
PM
a
f g b
d c
1 2 L 3 4 R 5 6
A B C D

CS-44 BOARD IC506		LCD				
Signal	Pin No.	Pin No.	COM. 1	COM. 2	COM. 3	COM. 4
COM3	24	1				COM. 4
COM2	23	2			COM. 3	
COM1	22	3		COM. 2		
COM0	21	4	COM. 1			
S22	11	5	AM	▯	❘ ❘	👤
S7	76	6	1f	1g	1e	1d
S8	77	7	1a	1b	1c	SP
S3	72	8	1			
S4	73	9	2			3
S9	78	10	2f	2g	2e	2d
S10	79	11	2a	2b	2c	LP
S5	74	12	: (L)	• (L)	AUTO	MANUAL
S11	80	13	3f	3g	3e	3d
S12	1	14	3a	3b	3c	COUNTER
S13	2	15	4f	4g	4e	4d
S14	3	16	4a	4b	4c	
S6	75	17	: (R)	• (R)	🏌	⛷
S15	4	18	5f	5g	5e	5d
S16	5	19	5a	5b	5c	ZERO MEM
S17	6	20	6f	6g	6e	6d
S18	7	21	6a	6b	6c	PM
S19	8	22	📼	▰ (A)	▰ (C)	
S20	9	23	💧		▭	⏏
S21	10	24		▰ (B)	▰ (D)	

CS-44 BOARD (4/5)

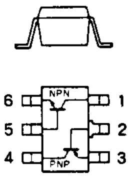


- **SIGNAL PATH**

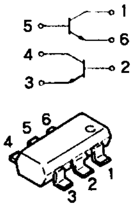
	VIDEO SIGNAL			AUDIO SIGNAL
	CHROMA	Y	Y/CHROMA	
REC	➡	➡»	➡⋙	➡
PB	⇨	⇨»	⇨⋙	⇨

4-3. SEMICONDUCTORS

FC149
XN4312
XN4601


6
5
4
NPN
PNP
1
2
3

XN4213
XN4215
XN4501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6
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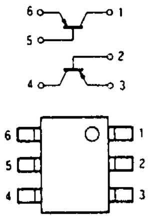
2
3
5
6
4
2
1
3

XN4401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1
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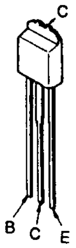
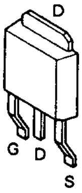
4
3
6
1
5
2
4
3

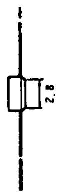
2SB1202STFA



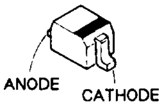
2SJ179



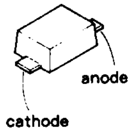
LN1261CAL



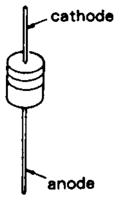
MA110
1SS352


ANODE
CATHODE

MA728
MA8082-M


anode
cathode

RD7.5ES


cathode
anode

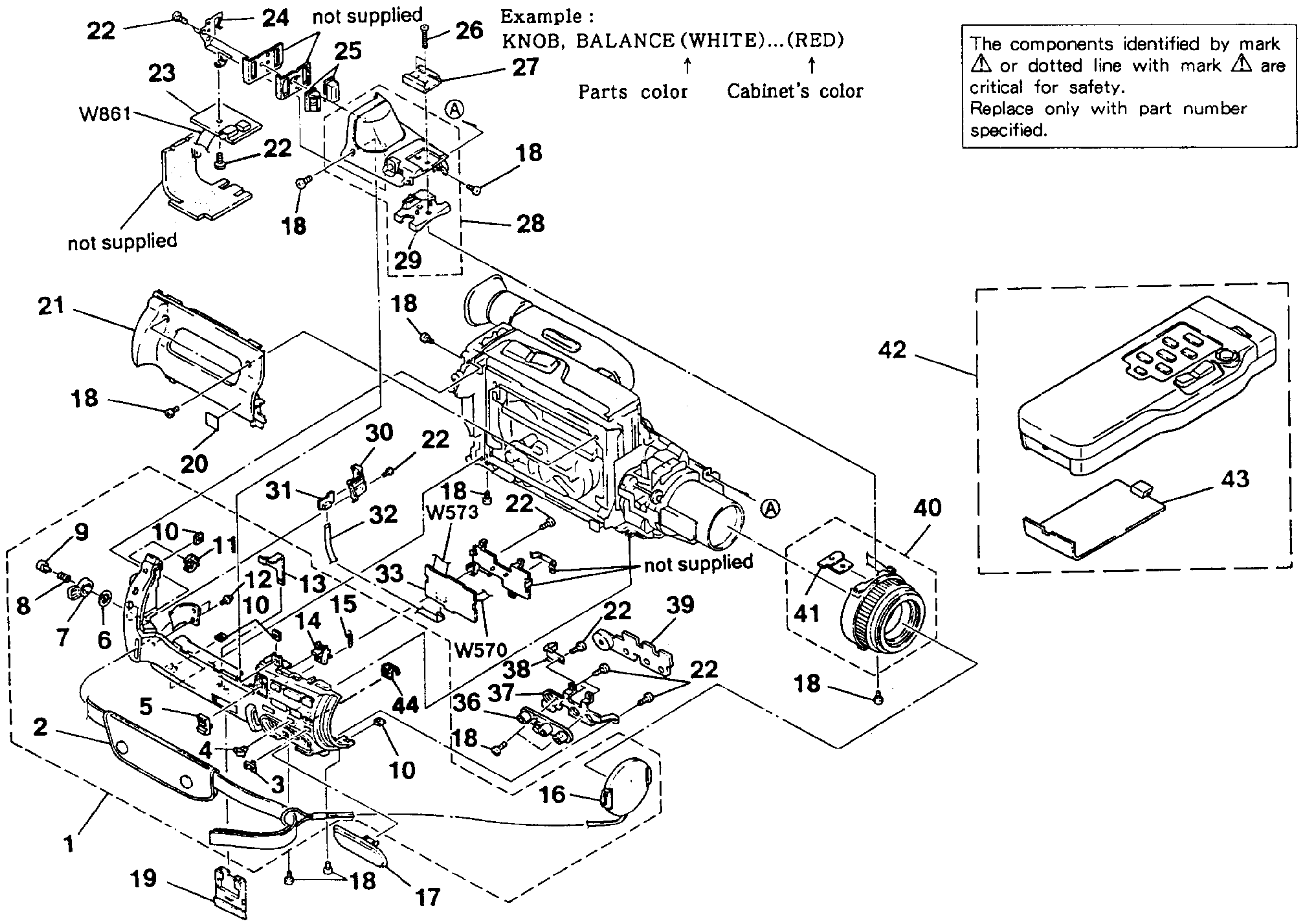
SECTION 5
EXPLODED VIEWS

NOTE:

- −XX, −X mean standardized parts, so they may have some differences from the original one.
- Items marked "*" are not stocked since they are seldom required for routine service. Some delay should be anticipated when ordering these items.
- Color Indication of Appearance Parts Example :
  KNOB, BALANCE (WHITE)...(RED)
  ↑ Parts color ↑ Cabinet's color
- The mechanical parts with no reference number in the exploded views are not supplied.
- Hardware (# mark) list is given in the last of this parts list.

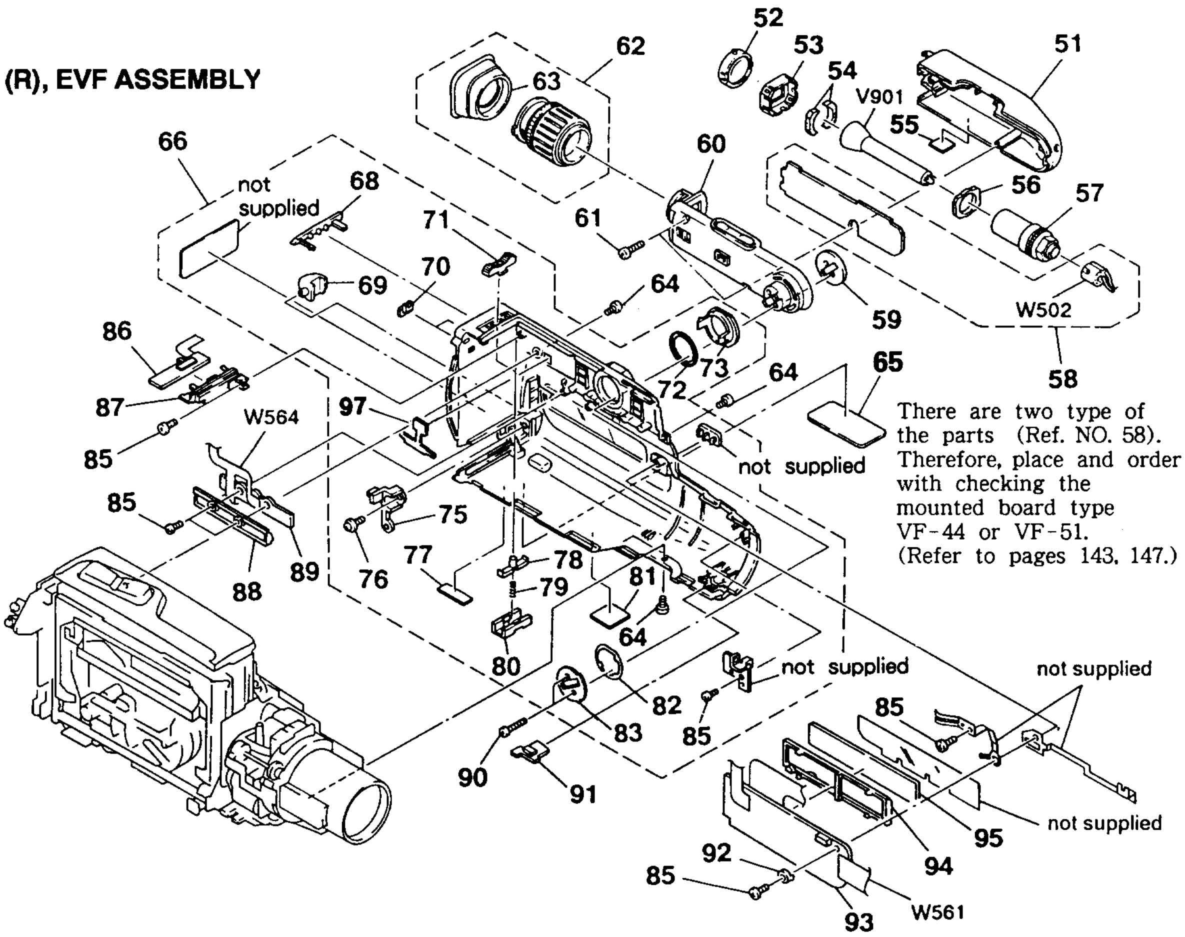
The components identified by mark ⚠ or dotted line with mark ⚠ are critical for safety.
Replace only with part number specified.

5-1. CABINET (UPPER), (L) ASSEMBLY



Ref. No.	Part No.	Description	Remarks
1	X-3941-482-1	CABINET (L) ASSY	
2	3-736-807-01	BELT, GRIP	
3	3-947-479-01	KNOB, I/O	
4	3-947-480-01	KNOB, EDIT	
5	3-946-195-01	BUTTON, EJECT	
6	3-736-364-01	SPRING	
7	3-942-985-01	KNOB, STAND-BY	
8	3-578-221-00	SPRING, COMPRESSION	
9	3-736-343-01	BUTTON, S/S	
10	3-718-233-01	NUT, PLATE	
11	3-946-260-01	HOLDER, STAND-BY KNOB	
12	3-669-480-21	+ PTPWH 2	
13	1-550-743-11	HOLDER, BATTERY	
14	3-946-194-01	LOCK, EJECT	
15	3-570-896-00	SPRING, TENSION	
16	A-7091-810-A	CAP BLOCK ASSY, LENS	
17	3-947-486-01	LID (M), JACK	
18	3-719-381-01	SCREW (M2X4)	
19	X-3941-541-1	HOLDER ASSY, LITHIUM	
* 20	3-703-713-41	STICKER, SONY SYMBOL (10)	
21	X-3942-642-1	LID ASSY, CASSETTE (FX620)	
21	X-3943-013-1	LID ASSY, CASSETTE (FX600)	
22	3-948-339-01	SCREW (BTP) (2X5), HEAD	
23	A-7063-550-A	MA-168 BOARD, COMPLETE	
24	3-947-471-01	PLATE, GROUND, MA	
25	1-542-162-11	MICROHONE UNIT	
26	3-948-809-31	SCREW (M2X12)	
27	3-724-511-01	SHOE, ACCESSORY	
28	X-3942-644-1	CABINET (UPPER) ASSY	
29	3-946-234-01	PRISM, REMOTE CONTROL	
30	3-946-185-01	HOLDER, SW	
31	A-7071-805-A	SW-221 BOARD, COMPLETE	
32	1-690-604-11	CABLE, FLAT (FFC-33) 4P	
33	A-7071-803-A	VK-30 BOARD, COMPLETE	
36	1-537-415-11	TERMINAL BOAD	
37	3-947-485-01	BRACKET, PJ	
38	3-947-487-01	PLATE, GROUND, PJ	
39	A-7071-804-A	PJ-55 BOARD, COMPLETE	
40	1-223-355-11	RES, VAR, CARBON (MF) 50K	
41	3-946-172-01	SHEET METAL, SHOE	
42	1-693-017-11	REMOTE COMMANDER (CAM CODER)	
43	3-947-500-01	LID, BATTERY CASE	
44	3-946-193-01	KNOB, REC	
W570	1-647-480-11	FP-6 FLEXIBLE BOARD	
W573	1-690-774-11	CABLE, FLAT (FFC-56) 11P	
W861	1-690-773-11	CABLE, FLAT (FFC-53) 9P	

5-2. CABINET (R), EVF ASSEMBLY



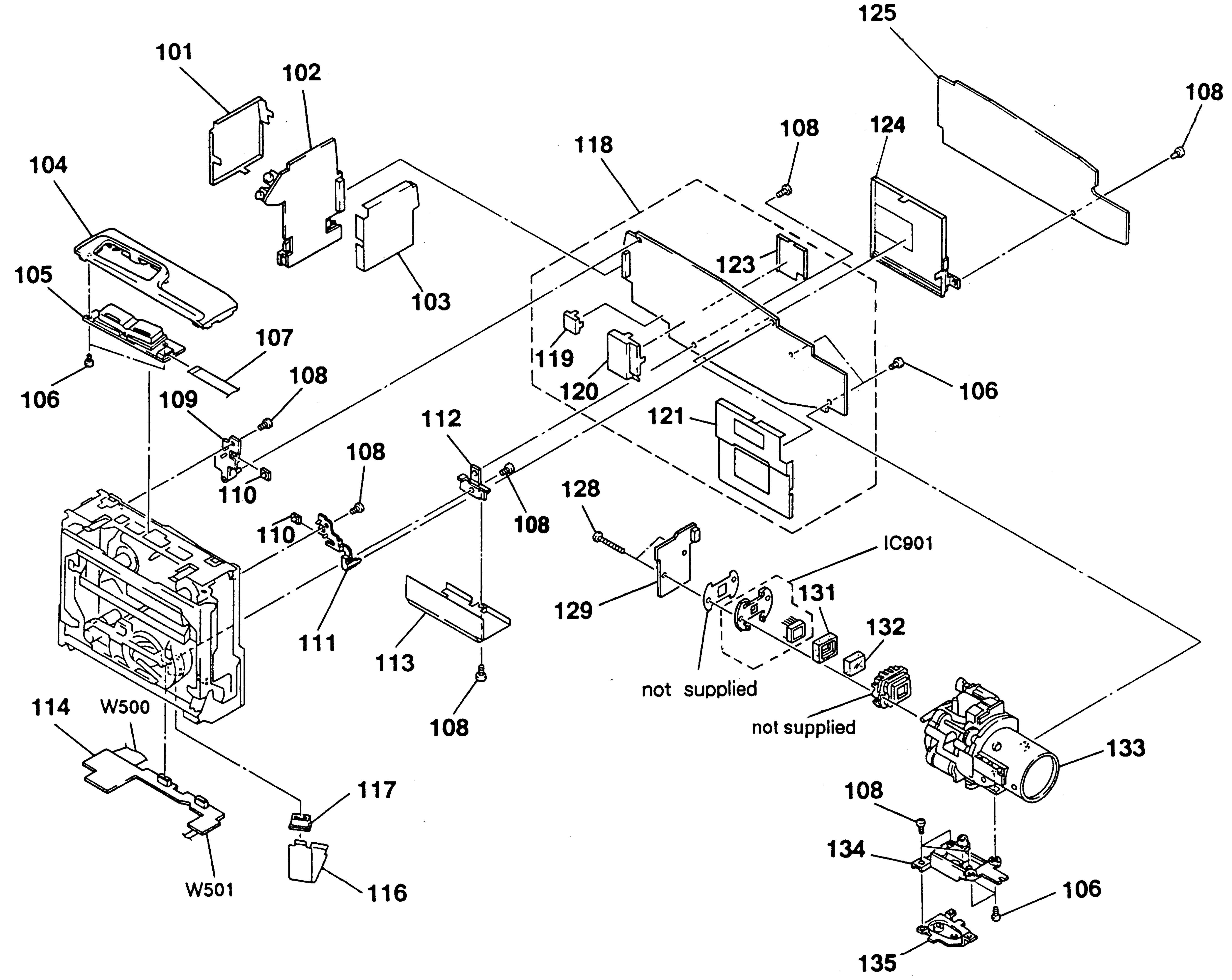
There are two type of
the parts (Ref. NO. 58).
Therefore, place and order
with checking the
mounted board type
VF-44 or VF-51.
(Refer to pages 143, 147.)

Ref. No.	Part No.	Description	Remarks
51	X-3941-319-1	CABINET (R) ASSY, EVF (FX600)	
51	X-3942-123-1	CABINET (R) ASSY, EVF (FX620)	
52	A-7081-905-A	LENS ASSY, VF	
53	3-946-203-01	HOLDER, CRT	
54	3-946-205-01	PACKING, CRT	
55	3-703-848-01	LABEL (N), SUB CAUTION	
56	3-946-204-01	COVER, CRT	
⚠57	1-451-310-21	DEFLECTION YOKE (B/W)	
58	A-7063-019-A	VF-44 BOARD, COMPLETE	
58	A-7063-366-A	VF-51 BOARD, COMPLETE	
59	3-946-202-01	JOINT, EVF	
60	X-3941-318-1	CABINET (L) ASSY, EVF	
61	3-713-790-31	SCREW (M2X8), TAPPING, P3	
62	A-7081-897-A	HOLDER BLOCK ASSY, FINDER	
63	3-946-212-01	EYE CUP	
64	3-719-381-01	SCREW (M2X4)	
* 65	3-952-651-01	LABEL, MODEL NUMBER (FX620)	
* 65	3-954-275-01	LABEL, MODEL NUMBER (FX600)	
66	X-3942-641-1	CABINET (R) ASSY (FX620)	
66	X-3943-012-1	CABINET (R) ASSY (FX600)	
68	3-946-256-01	CAP, POWER	
69	3-946-246-01	BUTTON, BATTERY RELEASE	
70	3-946-251-01	BUTTON, ON/OFF	
71	3-946-248-01	BUTTON, POWER	
72	3-946-253-01	RING, TILT	
73	3-946-252-01	SLEEVE, EVF	

Ref. No.	Part No.	Description	Remarks
75	3-946-250-01	CLAW, BATTERY LOCK	
76	3-669-480-21	+ PTPWH 2	
* 77	3-704-367-01	LABEL (FX620)	
78	3-946-186-01	PUSH BUTTON, POWER	
79	3-303-973-00	SPRING, COMPRESSION	
80	3-946-249-01	PLATE, FUNCTION, POWER	
81	3-704-256-01	LABEL, CAUTION (FX620)	
82	3-946-255-01	SPRING, LEAF, TILT	
83	3-946-254-01	PLATE, LOCK, TILT	
85	3-948-339-01	SCREW (BTP) (2X5), HEAD	
86	A-7071-808-A	PK-37 BOARD, COMPLETE	
87	3-946-198-01	RETAINER, PK	
88	3-947-474-01	RETAINER, DK	
89	A-7071-807-A	DK-27 BOARD, COMPLETE	
90	3-740-546-51	SCREW (M2X9)	
91	A-7071-809-A	FK-58 BOARD, COMPLETE	
92	3-947-482-01	SPACER, CK	
93	A-7071-806-A	CK-63 BOARD, COMPLETE	
94	3-947-478-01	HOLDER, LCD	
95	1-809-663-11	DISPLAY PANEL, LIQUID CRYSTAL	
97	3-947-106-01	CLAW, EVF LOCK	
⚠W502	1-526-978-51	SOCKET ASSY, CRT	
W561	1-690-775-11	CABLE, FLAT (FFC-52) 20P	
W564	1-643-081-11	FP-492 FLEXIBLE BOARD	
⚠V901	1-546-091-11	CATHODE-RAY TUBE, B/W	

Note: The components identified by mark ⚠ or dotted line with mark ⚠ are critical for safety.
Replace only with part number specified.

5-3. MAIN BOARD ASSEMBLY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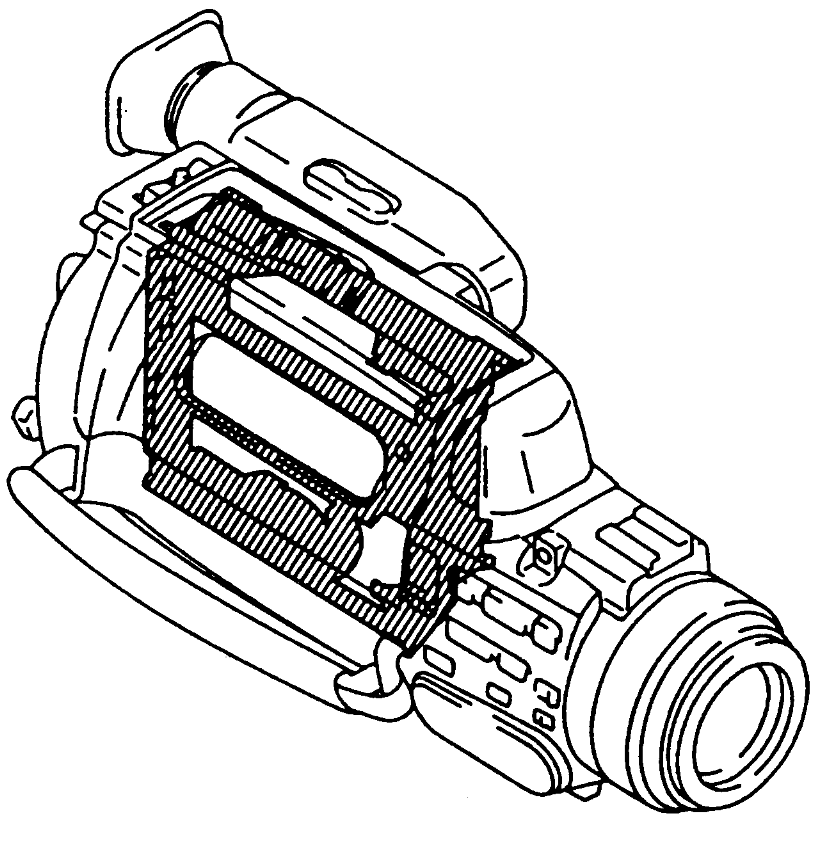
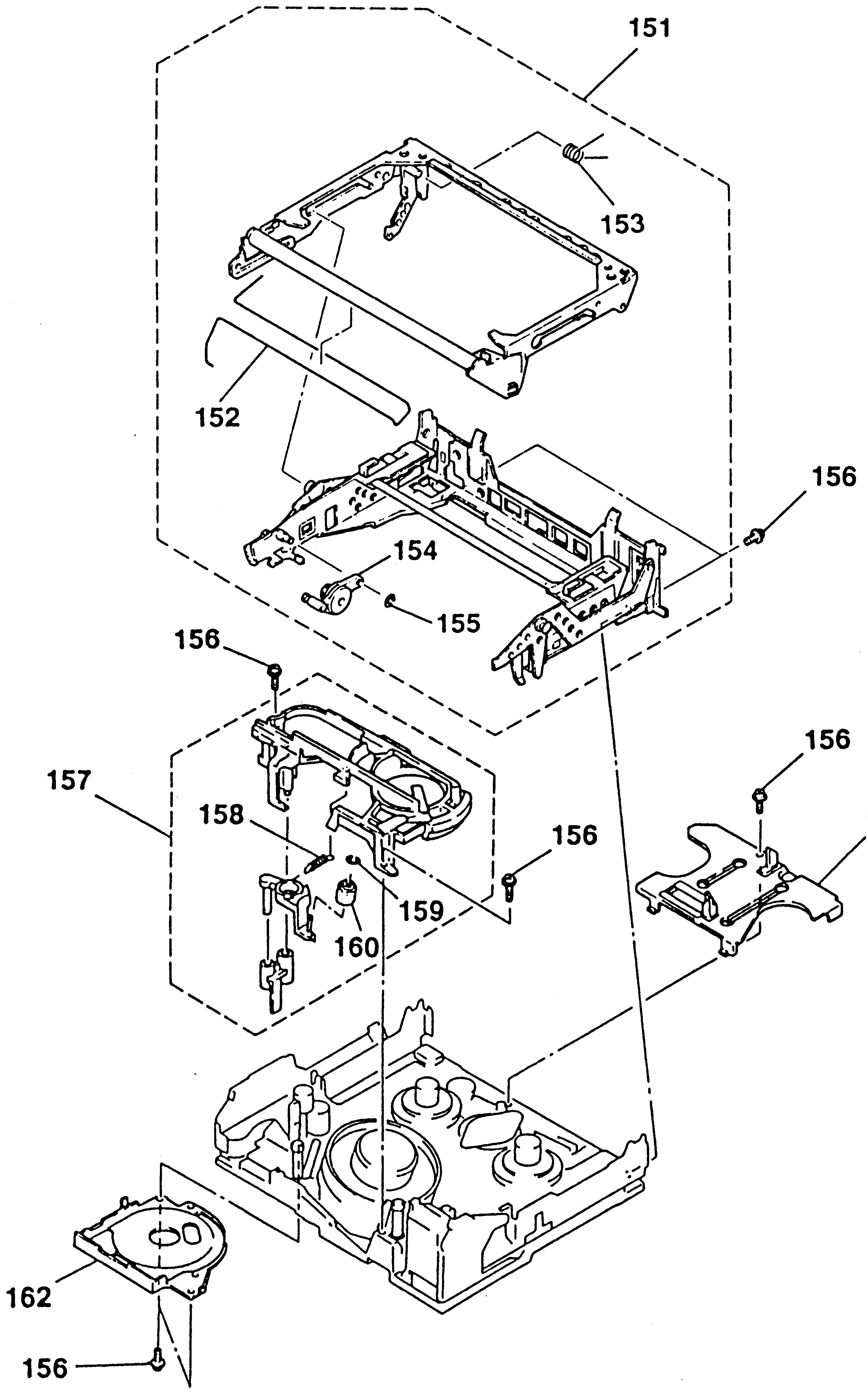
110
128
110
108
IC901
131
129
132
111
113
not supplied
114
W500
108
not supplied
133
117
108
134
106
W501
116
135

Ref. No.	Part No.	Description	Remarks
* 101	3-946-183-01	CASE (MAIN), SHIELD, PS	
102	A-7063-546-A	PS-312 BOARD, COMPLETE	
* 103	X-3941-499-1	SHIELD (LID) ASSY, PS	
104	X-3941-320-1	LID ASSY, LS	
105	1-692-257-21	SWITCH, PUSH (ZOOM)	
106	3-948-339-01	SCREW (BTP) (2X5), HEAD	
107	1-645-271-11	FP-575 FLEXIBLE BOARD	
108	3-719-381-01	SCREW (M2X4)	
* 109	X-3942-639-1	HOLDER (R) ASSY	
110	3-718-233-01	NUT, PLATE	
* 111	3-952-645-01	HOLDER (F)	
112	3-946-175-01	HOLDER (B), CS	
113	X-3941-522-1	PLATE ASSY, SHIELD, DRUM	
114	A-7063-549-A	SL-31 BOARD, COMPLETE	
116	1-642-187-11	FP-426 FLEXIBLE BOARD	
117	1-691-471-11	CONNECTOR, TRANSLATION 11P	
118	A-7063-547-A	CS-44 BOARD, COMPLETE	
* 119	3-946-179-01	CASE (MAIN), SHIELD, FE	
* 120	3-948-499-01	CASE (MAIN), SHIELD, RP	
* 121	X-3941-498-1	SHIELD (LID) ASSY, CAMERA	
* 123	3-946-178-01	CASE (LID), SHIELD, RP	
* 124	X-3941-314-1	SHIELD ASSY, CAMERA	
125	A-7063-548-A	VA-83 BOARD, COMPLETE	
128	3-947-268-01	SCREW (B TIGHT) (2), TAPPING	
129	A-7063-545-A	CD-112 BOARD, COMPLETE	
131	3-946-857-11	RUBBER (S), SEAL	
132	1-547-558-21	FILTER BLOCK, OPTICAL	
133	1-547-606-11	LENS, ZOOM (VCL-6012WA)	
134	3-946-223-01	HOLDER (C), LENS	
135	3-946-224-01	SHEET METAL, TRIPOD	
IC901	A-7030-368-A	CCD BLOCK ASSY (AUTO)	
W500	1-644-461-31	FP-600 MOUNT BOARD	
W501	1-642-186-11	FP-437 FLEXIBLE BOARD	

5-4. CASSETTE COMPARTMENT ASSEMBLY

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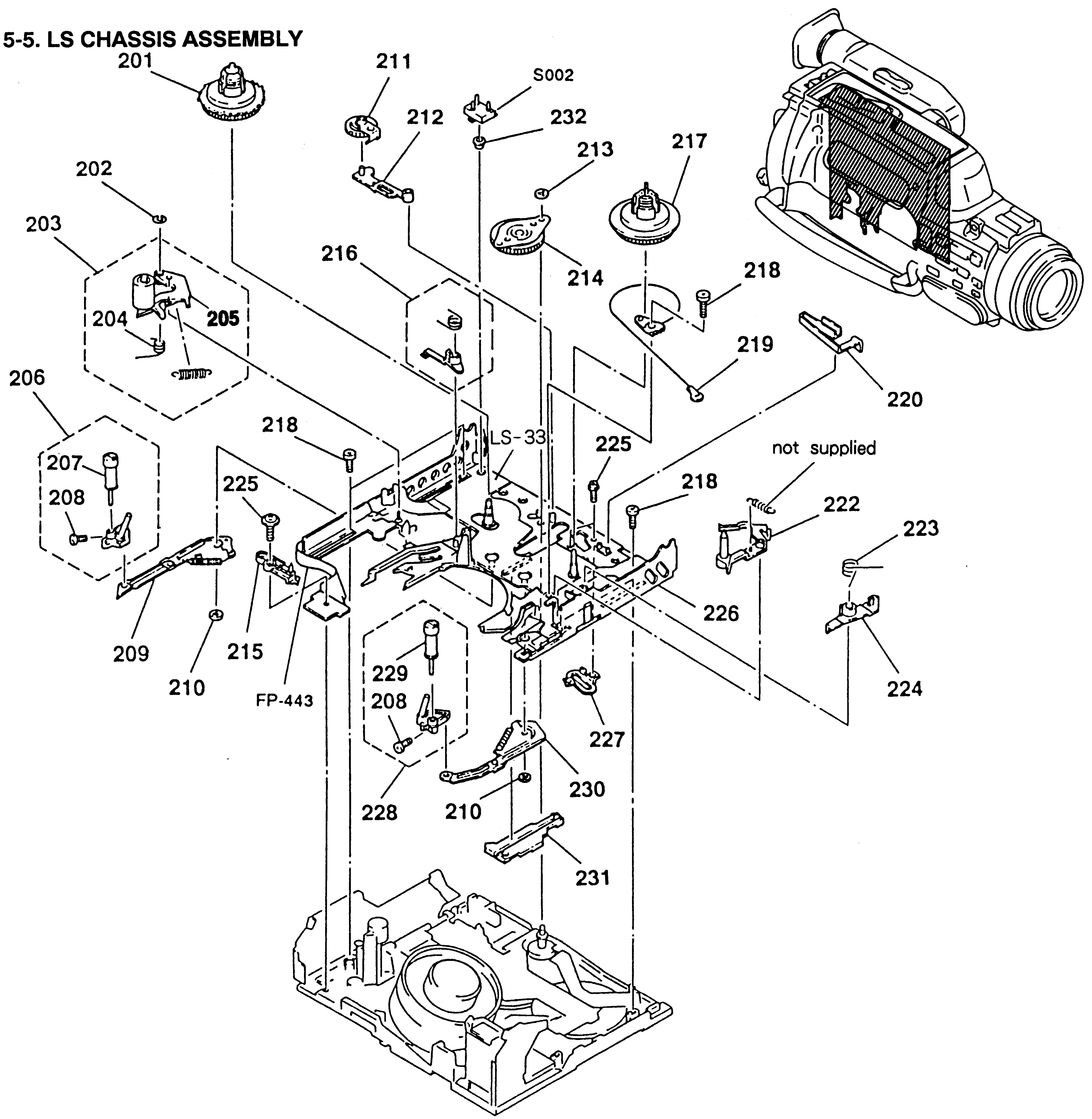
Ref. No.	Part No.	Description	Remarks
151	A-7040-312-K	CASSETTE COMPARTMENT BLOCKASSY	
152	3-945-773-01	BAR, TORSION	
153	3-945-771-01	SPRING, TORSION	
154	X-3941-287-2	DAMPER ASSY	
155	3-315-384-31	WASHER, STOPPER	
156	3-947-503-01	SCREW (M1.4X2.5)	
157	A-7040-309-A	PROTECT (BASE) BLOCK ASSY	
158	3-945-760-01	SPRING, TENSION	
159	3-321-393-01	WASHER, STOPPER	
160	X-3166-813-1	ROLLER ASSY, HC	
161	X-3941-280-1	RETAINER ASSY, GOOSENECK	
162	3-945-733-01	COVER, CAPSTAN	

5-5. LS CHASSIS ASSEMBLY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S002
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232
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not supplied
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225
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223
226
209
215
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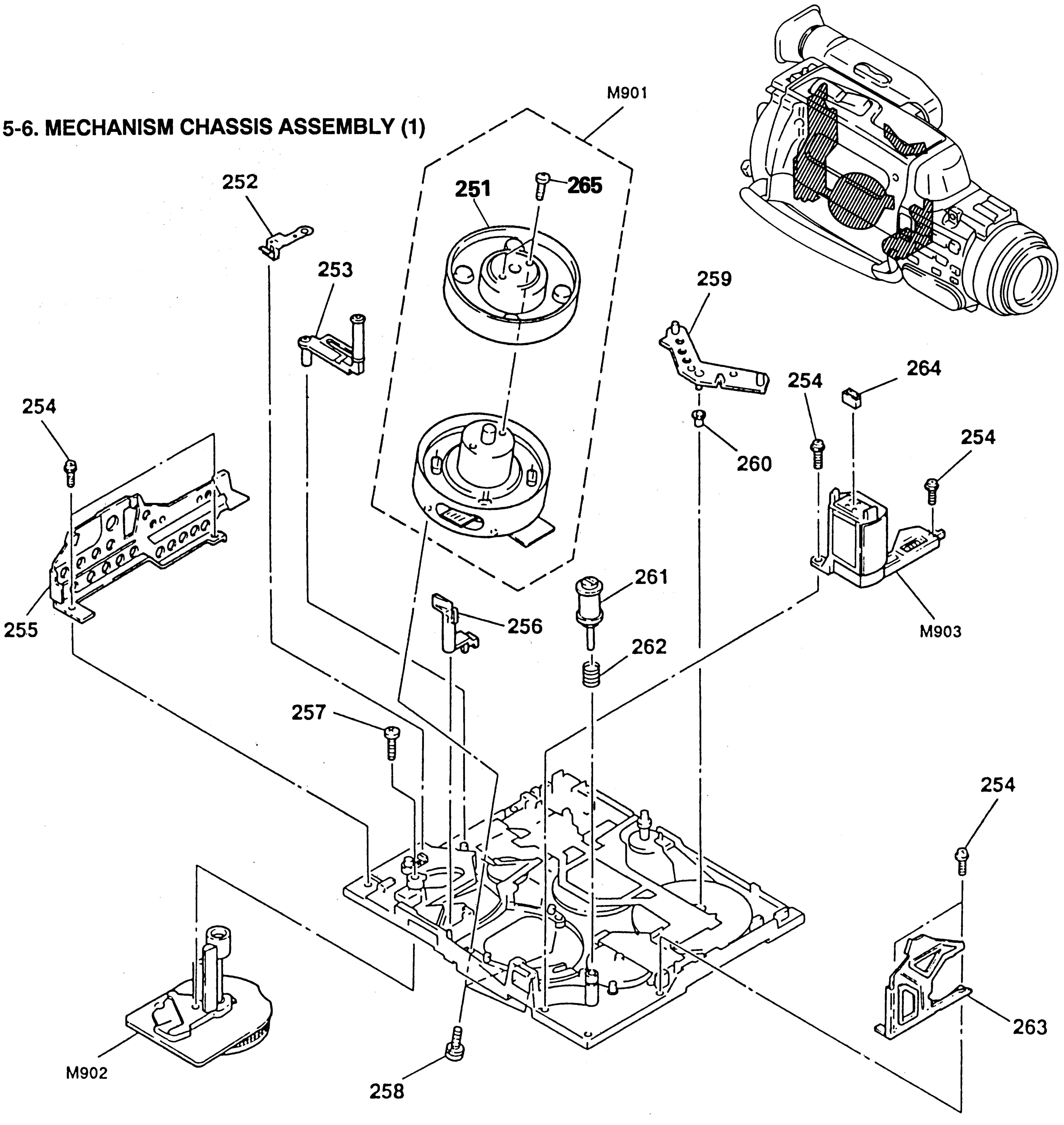
FP-443
229
208
224
227
230
228
210
231

Ref. No.	Part No.	Description	Remarks
201	X-3941-274-1	TABLE ASSY, REEL, T	
202	3-331-007-21	WASHER	
203	X-3941-271-5	ARM ASSY, PINCH	
204	3-945-743-01	SPRING, TORSION	
205	X-3695-416-1	PINCH ROLLER ASSY	
206	A-7040-307-A	GUIDE (BASE) (T) BLOCK ASSY	
207	X-3941-424-1	ROLLER ASSY, TG6	
208	3-947-504-01	SCREW (M1.2X2)	
209	X-3941-267-1	ARM (T) ASSY, GUIDE	
210	3-669-465-00	WASHER (1.5), STOPPER	
211	X-3941-273-1	SOFT ASSY, T	
212	3-945-753-01	ARM, T SOFT	
213	3-726-829-01	WASHER, STOPPER	
214	X-3941-279-5	GEAR ASSY, GOOSENECK	
215	3-947-644-01	RETAINER, TG5 (BASE)	
216	A-7040-321-A	CLAW BLOCK ASSY, T HARD	
217	X-3941-275-6	TABLE ASSY, REEL, S	
218	3-945-756-01	SCREW (M1.4X3)	
219	X-3941-277-1	STRING BLOCK ASSY	
220	3-945-801-01	BRAKE, S SOFT	
222	X-3941-276-1	TG1 ASSY	
223	3-945-752-01	SPRING, TORSION	
224	3-945-799-01	BRAKE, S HARD	
225	3-947-503-01	SCREW (M1.4X2.5)	
226	X-3941-265-1	CHASSIS ASSY, LS	
227	3-945-784-01	PLATE, CAM, LS	
228	A-7040-306-A	GUIDE (BASE) (S) BLOCK ASSY	
229	X-3941-269-1	ROLLER ASSY, TG3	
230	X-3941-266-1	ARM (S) ASSY, GUIDE	
231	3-945-837-01	SLIDER, GL	
232	3-949-881-01	SLEEVE	
S002	1-572-987-11	SWITCH, PUSH (3 KEY)	

5-6. MECHANISM CHASSIS ASSEMBLY (1)


M901
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M903
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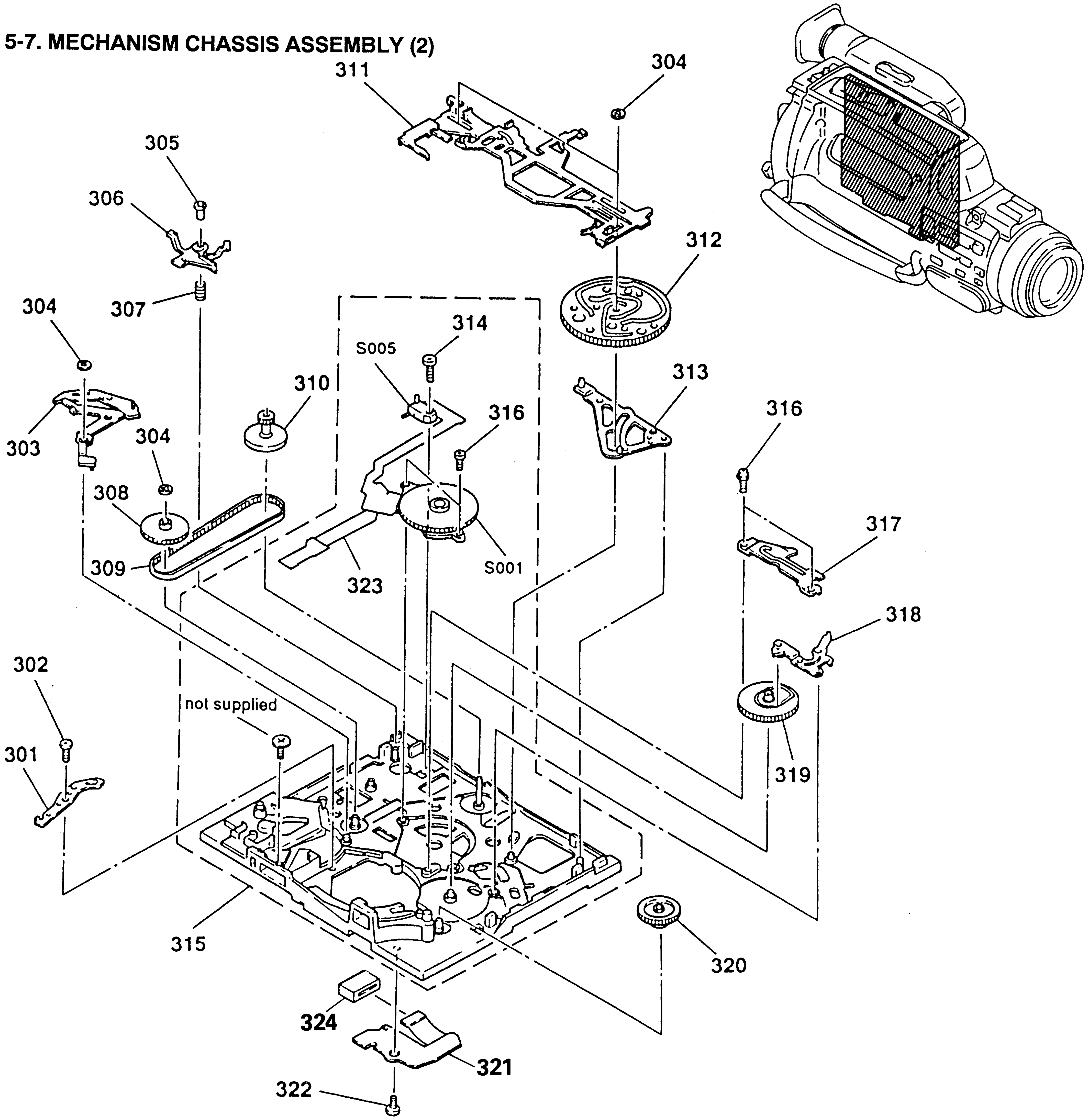
263
M902
258

Ref. No.	Part No.	Description	Remarks
251	A-7049-501-A	DRUM, ASSY UPPER (DGR-78-R)	
252	3-945-822-01	SPRING, LEAF, TG7 ARM	
253	A-7040-305-A	ARM BLOCK ASSY, TG7	
254	3-947-503-01	SCREW (M1. 4X2. 5)	
255	X-3941-255-1	PLATE (T) ASSY, SIDE	
256	3-945-735-01	ARM, HC CONVERSION	
257	3-713-786-71	SCREW (M2X5)	
258	3-686-493-01	SCREW (M2X5), P1	
259	3-945-701-01	ARM, LS	
260	3-945-702-01	ROLLER, LS	
261	X-3941-262-1	ROLLER ASSY, TG2	
262	3-945-774-01	SPRING, COMPRESSION	
263	3-945-691-01	PLATE (S), SIDE	
264	1-568-323-11	CONNECTOR, BOARD TO BOARD 4P	
265	7-627-853-59	SCREW (+P 2X5)	
M901	A-7048-564-A	DRUM ASSY (DGH-78A-R)	
M902	8-835-477-01	MOTOR, DC SCE-0101A (CAPSTAN)	
M903	A-7040-304-A	MOTOR BLOCK ASSY, LM (LOADING)	

5-7. MECHANISM CHASSIS ASSEMBLY (2)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S005
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S001
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not supplied
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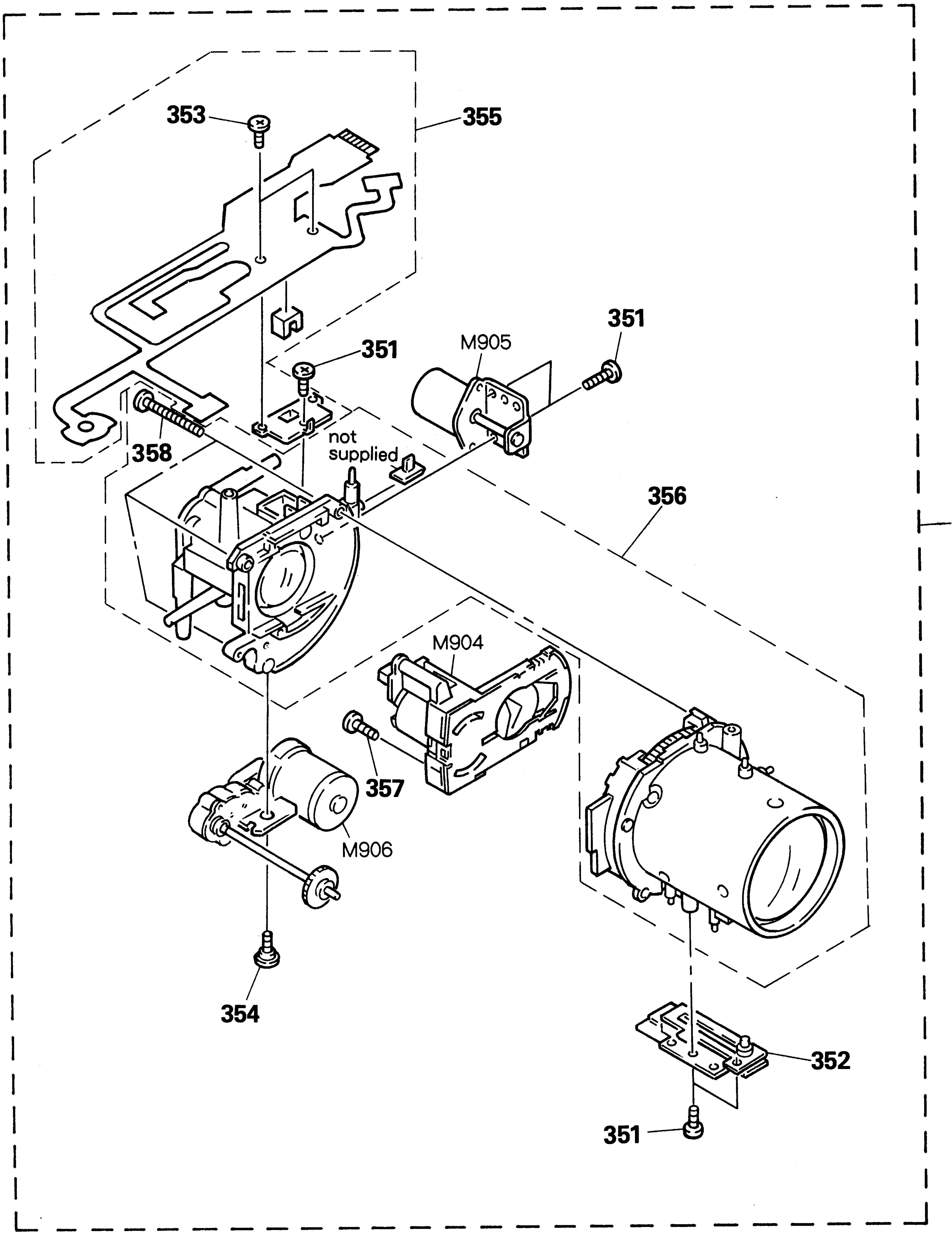
Ref. No.	Part No.	Description	Remarks
301	3-945-734-01	ARM, HC DRIVING	
302	3-728-103-11	SCREW (M1.4X1.6), SPECIAL HEAD	
303	X-3941-259-1	ARM ASSY, PINCH PRESS	
304	3-726-829-01	WASHER, STOPPER	
305	3-945-730-01	SLEEVE, EJECT	
306	3-945-706-01	LEVER, EJECT	
307	3-945-729-01	SPRING, COMPRESSION	
308	X-3941-256-1	GEAR ASSY, CHANGE	
309	3-944-539-01	BELT, RELAY	
310	3-945-695-01	PULLEY, RELAY	
311	X-3941-260-1	SLIDER ASSY, M	
312	3-945-696-02	CAM	
313	X-3941-258-1	ARM ASSY, GL	
314	3-713-786-71	SCREW (M2X5)	
315	A-7040-303-A	CHASSIS ASSY, MECHANICAL	
316	3-947-503-01	SCREW (M1.4X2.5)	
317	3-945-722-01	RETAINER, GEAR	
318	X-3941-257-1	ARM ASSY, FF	
319	3-945-697-01	GEAR (B), L	
320	3-945-700-01	GEAR (A), L	
321	1-641-643-12	FP-444 FLEXIBLE BOARD	
322	3-945-756-01	SCREW (M1.4X3)	
323	1-641-639-13	FP-442 FLEXIBLE BOARD	
324	1-691-254-13	CONNECTOR, TRANSLATION 10P	
S001	1-572-986-11	SWTICH, ROTARY (ENCODER)	
S005	1-570-771-21	SWITCH	

5-8. ZOOM LENS ASSEMBLY (VCL-6012WA)



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M905
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not supplied
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M904
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M906
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Ref. No.	Part No.	Description	Remarks
351	3-708-302-01	SCREW, FITTING M. E	
352	3-708-643-01	ENCODER, ZOOM	
353	7-627-552-08	SCREW +P 1.7X2.5	
354	3-708-649-01	SCREW	
355	3-708-645-01	F.P.C	
356	3-708-646-01	LENS ASSY	
357	7-627-552-58	SCREW +P 1.7X5	
358	3-708-648-01	SCREW	
359	1-547-606-11	LENS, ZOOM (VCL-6012WA)	
M904	3-708-644-01	IRIS ASSY	
M905	3-708-612-01	FOCUS MOTOR ASSY, STEPPING	
M906	3-708-642-01	ZOOM MOTOR ASSY	

SECTION 6
ELECTRICAL PARTS LIST

NOTE:

When indicating parts by reference number, please include the board name.

The components identified by mark ⚠ or dotted line with mark ⚠ are critical for safety.
Replace only with part number specified.

- Due to standardization, replacements in the parts list may be different from the parts specified in the diagrams or the components used on the set.
- −XX, −X mean standardized parts, so they may have some difference from the original one.
- Items marked "*" are not stocked since they are seldom required for routine service. Some delay should be anticipated when ordering these items.
- CAPACITORS :
  uF : μF
- RESISTORS
  All resistors are in ohms.
  METAL : metal-film resistor
  METAL OXIDE: Metal Oxide-film resistor
  F : nonflammable
- COILS
  uH : μH
- SEMICONDUCTORS
  In each case, u : μ, for example :
  uA... : μA... , uPA... , μPA... ,
  uPB... , μPB... , uPC... , μPC... ,
  uPD..., μPD...

Ref. No.	Part No.	Description			Remarks
	A-7063-545-A	CD-112 BOARD, COMPLETE			
		**********************			
					(Ref. No. 1,000 Series)
		< CAPACITOR >			
C901	1-135-214-21	TANTAL. CHIP	4.7uF	20%	20V
C902	1-128-013-11	ELECT CHIP	1uF	20%	50V
C903	1-128-008-11	ELECT CHIP	3.3uF	20%	35V
C904	1-162-964-11	CERAMIC CHIP	0.001uF	10%	50V
C905	1-162-637-11	CERAMIC CHIP	0.47uF		16V
C906	1-126-607-11	ELECT CHIP	47uF	20%	4V
C907	1-128-004-11	ELECT CHIP	10uF	20%	16V
C908	1-128-007-11	ELECT CHIP	2.2uF	20%	35V
C909	1-162-974-11	CERAMIC CHIP	0.01uF		50V
C910	1-164-156-11	CERAMIC CHIP	0.1uF		25V
C911	1-164-360-11	CERAMIC CHIP	0.1uF		16V
C912	1-162-974-11	CERAMIC CHIP	0.01uF		50V
		< CONNECTOR >			
CN901	1-573-372-21	CONNECTOR, BOARD TO BOARD 18P			
CN902	1-566-537-11	CONNECTOR, FPC (NON ZIF) 5P			
		< DIODE >			
D901	8-719-820-05	DIODE	1SS181		
D903	8-719-820-05	DIODE	1SS181		
D904	8-719-800-76	DIODE	1SS226		
		< COIL >			
L901	1-412-032-11	INDUCTOR CHIP 100uH			
		< TRANSISTOR >			
Q901	8-729-602-21	TRANSISTOR	2SC4154		
Q902	8-729-402-13	TRANSISTOR	XN1501		
Q903	8-729-232-86	TRANSISTOR	2SK1875-BL/V		

IC901 is not supplied as an independent unit. It is always supplied with its board.

Ref. No.	Part No.	Description			Remarks
		< RESISTOR >			
R901	1-216-845-11	METAL CHIP	100K	5%	1/16W
R902	1-216-857-11	METAL CHIP	1M	5%	1/16W
R903	1-216-839-11	METAL CHIP	33K	5%	1/16W
R904	1-216-843-11	METAL CHIP	68K	5%	1/16W
R905	1-216-849-11	METAL CHIP	220K	5%	1/16W
R906	1-216-819-11	METAL CHIP	680	5%	1/16W
R907	1-216-835-11	METAL CHIP	15K	5%	1/16W
R908	1-216-850-11	METAL CHIP	270K	5%	1/16W
R909	1-216-833-11	METAL CHIP	10K	5%	1/16W
R910	1-216-809-11	METAL CHIP	100	5%	1/16W
R911	1-216-828-11	METAL CHIP	3.9K	5%	1/16W
R913	1-216-864-11	METAL CHIP	0	5%	1/16W
R914	1-216-821-11	METAL CHIP	1K	5%	1/16W
R915	1-216-821-11	METAL CHIP	1K	5%	1/16W
R916	1-216-829-11	METAL CHIP	4.7K	5%	1/16W
R917	1-216-821-11	METAL CHIP	1K	5%	1/16W
R921	1-216-829-11	METAL CHIP	4.7K	5%	1/16W

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Ref. No.	Part No.	Description			Remarks
	A-7071-806-A	CK-63 BOARD, COMPLETE			
		*********************			
					(Ref. No. 7,000 Series)
		< CAPACITOR >			
C561	1-164-337-11	CERAMIC CHIP	2.2uF		16V
		< CONNECTOR >			
* CN562	1-580-756-21	PIN, CONNECTOR 7P			
		< DIODE >			
D529	8-719-404-46	DIODE	MA110		
D530	8-719-802-36	DIODE	1SS250		
D560	8-719-820-05	DIODE	1SS181		
D561	8-719-820-05	DIODE	1SS181		
D562	8-719-404-35	DIODE	MA141WK		
D566	8-719-110-03	DIODE	RD7.5ES		

Ref. No.	Part No.	Description			Remarks
		< COIL >			
L560	1-412-028-11	INDUCTOR CHIP 4.7uH			
		< SWITCH >			
S559	1-572-938-21	SWITCH, TACTIL (FOCUS)			
S564	1-572-938-21	SWITCH, TACTIL (DATE(+))			
S565	1-572-938-21	SWITCH, TACTIL (TIME(NEXT))			
S566	1-572-938-21	SWITCH, TACTIL (AGE/EVENT)			
S567	1-572-938-21	SWITCH, TACTIL (BACK LIGHT)			
S568	1-571-275-41	SWITCH, SLIDE (AUTO LOCK)			
S569	1-572-938-21	SWITCH, TACTIL (PROGRAM AE)			
		< FLAT CABLE >			
W561	1-690-775-11	CABLE, FLAT (FFC-52) 20P			

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	A-7063-547-A	CS-44 BOARD, COMPLETE			
		**********************			
					(Ref.No.1,000 Series)
	X-3941-498-1	CASE (LID), SHIELD, CAMERA			
*	3-946-178-01	CASE (LID), SHIELD, RP			
*	3-946-179-01	CASE (MAIN), SHIELD, FE			
*	3-948-499-01	CASE (MAIN), SHIELD, RP			
		< CAPACITOR >			
C001	1-162-974-11	CERAMIC CHIP	0.01uF		50V
C002	1-162-974-11	CERAMIC CHIP	0.01uF		50V
C003	1-128-004-11	ELECT CHIP	10uF	20%	16V
C004	1-164-633-11	CERAMIC CHIP	0.1uF	10%	25V
C005	1-164-360-11	CERAMIC CHIP	0.1uF		16V
C006	1-164-633-11	CERAMIC CHIP	0.1uF	10%	25V
C007	1-128-004-11	ELECT CHIP	10uF	20%	16V
C008	1-164-633-11	CERAMIC CHIP	0.1uF	10%	25V
C009	1-164-633-11	CERAMIC CHIP	0.1uF	10%	25V
C010	1-164-633-11	CERAMIC CHIP	0.1uF	10%	25V
C011	1-164-633-11	CERAMIC CHIP	0.1uF	10%	25V
C012	1-162-974-11	CERAMIC CHIP	0.01uF		50V
C013	1-162-974-11	CERAMIC CHIP	0.01uF		50V
C014	1-128-004-11	ELECT CHIP	10uF	20%	16V
C016	1-162-974-11	CERAMIC CHIP	0.01uF		50V
C017	1-162-974-11	CERAMIC CHIP	0.01uF		50V
C018	1-128-004-11	ELECT CHIP	10uF	20%	16V
C019	1-162-974-11	CERAMIC CHIP	0.01uF		50V
C020	1-164-360-11	CERAMIC CHIP	0.1uF		16V
C021	1-162-974-11	CERAMIC CHIP	0.01uF		50V
C022	1-164-360-11	CERAMIC CHIP	0.1uF		16V
C023	1-162-974-11	CERAMIC CHIP	0.01uF		50V
C024	1-164-360-11	CERAMIC CHIP	0.1uF		16V
C025	1-128-004-11	ELECT CHIP	10uF	20%	16V
C026	1-162-974-11	CERAMIC CHIP	0.01uF		50V
C041	1-164-633-11	CERAMIC CHIP	0.1uF	10%	25V
C042	1-162-953-11	CERAMIC CHIP	100PF	5%	50V
C043	1-162-927-11	CERAMIC CHIP	100PF	5%	50V
C044	1-162-927-11	CERAMIC CHIP	100PF	5%	50V
C045	1-164-217-11	CERAMIC CHIP	150PF	5%	50V
C046	1-164-360-11	CERAMIC CHIP	0.1uF		16V
C501	1-162-974-11	CERAMIC CHIP	0.01uF		50V
C502	1-162-974-11	CERAMIC CHIP	0.01uF		50V
C503	1-162-995-11	CERAMIC CHIP	0.022uF		50V
C504	1-162-995-11	CERAMIC CHIP	0.022uF		50V
C505	1-162-964-11	CERAMIC CHIP	0.001uF	10%	50V
C506	1-162-964-11	CERAMIC CHIP	0.001uF	10%	50V
C507	1-162-995-11	CERAMIC CHIP	0.022uF		50V
C508	1-162-995-11	CERAMIC CHIP	0.022uF		50V
C509	1-128-004-11	ELECT CHIP	10uF	20%	16V
C510	1-162-995-11	CERAMIC CHIP	0.022uF		50V
C511	1-162-974-11	CERAMIC CHIP	0.01uF		50V
C512	1-164-173-11	CERAMIC CHIP	0.0039uF	10%	50V
C513	1-162-964-11	CERAMIC CHIP	0.001uF	10%	50V
C514	1-162-995-11	CERAMIC CHIP	0.022uF		50V
C515	1-128-004-11	ELECT CHIP	10uF	20%	16V
C517	1-128-004-11	ELECT CHIP	10uF	20%	16V
C518	1-162-995-11	CERAMIC CHIP	0.022uF		50V
C519	1-128-004-11	ELECT CHIP	10uF	20%	16V
C520	1-164-489-11	CERAMIC CHIP	0.22uF	10%	16V
C521	1-163-809-11	CERAMIC CHIP	0.047uF	10%	25V
C522	1-162-970-11	CERAMIC CHIP	0.01uF	10%	25V
C523	1-162-965-11	CERAMIC CHIP	0.0015uF	10%	50V
C524	1-163-809-11	CERAMIC CHIP	0.047uF	10%	25V
C525	1-164-227-11	CERAMIC CHIP	0.022uF	10%	25V
C526	1-162-995-11	CERAMIC CHIP	0.022uF		50V
C527	1-163-035-00	CERAMIC CHIP	0.047uF		50V
C528	1-128-006-11	ELECT CHIP	4.7uF	20%	25V
C529	1-162-974-11	CERAMIC CHIP	0.01uF		50V
C530	1-162-918-11	CERAMIC CHIP	18PF	5%	50V
C531	1-162-917-11	CERAMIC CHIP	15PF	5%	50V
C532	1-162-905-11	CERAMIC CHIP	1PF	0.25PF	50V
C534	1-162-995-11	CERAMIC CHIP	0.022uF		50V
C535	1-128-004-11	ELECT CHIP	10uF	20%	16V
C536	1-128-004-11	ELECT CHIP	10uF	20%	16V
C538	1-164-360-11	CERAMIC CHIP	0.1uF		16V
C540	1-164-360-11	CERAMIC CHIP	0.1uF		16V
C541	1-126-204-11	ELECT CHIP	47uF	20%	16V
C542	1-164-360-11	CERAMIC CHIP	0.1uF		16V
C543	1-164-107-11	CERAMIC CHIP	0.15uF	10%	16V
C544	1-164-107-11	CERAMIC CHIP	0.15uF	10%	16V
C545	1-165-176-11	CERAMIC CHIP	0.047uF	10%	16V
C546	1-128-008-11	ELECT CHIP	3.3uF	20%	35V
C547	1-164-633-11	CERAMIC CHIP	0.1uF	10%	25V
C548	1-164-633-11	CERAMIC CHIP	0.1uF	10%	25V

Ref. No.	Part No.	Description			Remarks
C549	1-162-967-11	CERAMIC CHIP	0.0033uF	10%	50V
C550	1-162-967-11	CERAMIC CHIP	0.0033uF	10%	50V
C551	1-162-967-11	CERAMIC CHIP	0.0033uF	10%	50V
C552	1-162-970-11	CERAMIC CHIP	0.01uF	10%	25V
C553	1-163-038-00	CERAMIC CHIP	0.1uF		25V
C554	1-164-222-11	CERAMIC CHIP	0.22uF		25V
C555	1-164-222-11	CERAMIC CHIP	0.22uF		25V
C558	1-164-360-11	CERAMIC CHIP	0.1uF		16V
C559	1-126-397-11	ELECT	33uF	20%	25V
C560	1-128-004-11	ELECT CHIP	10uF	20%	16V
C563	1-162-966-11	CERAMIC CHIP	0.0022uF	10%	50V
C564	1-162-920-11	CERAMIC CHIP	27PF	5%	50V
C565	1-164-360-11	CERAMIC CHIP	0.1uF		16V
C566	1-162-917-11	CERAMIC CHIP	15PF	5%	50V
C568	1-124-778-00	ELECT CHIP	22uF	20%	6.3V
C569	1-164-337-11	CERAMIC CHIP	2.2uF		16V
C570	1-162-962-11	CERAMIC CHIP	470PF	10%	50V
C571	1-162-961-11	CERAMIC CHIP	330PF	10%	50V
C572	1-164-360-11	CERAMIC CHIP	0.1uF		16V
C573	1-162-974-11	CERAMIC CHIP	0.01uF		50V
C574	1-162-970-11	CERAMIC CHIP	0.01uF	10%	25V
C575	1-162-974-11	CERAMIC CHIP	0.01uF		50V
C576	1-128-004-11	ELECT CHIP	10uF	20%	16V
C577	1-162-927-11	CERAMIC CHIP	100PF	5%	50V
C578	1-164-222-11	CERAMIC CHIP	0.22uF		25V
C579	1-128-004-11	ELECT CHIP	10uF	20%	16V
C580	1-162-974-11	CERAMIC CHIP	0.01uF		50V
C581	1-164-360-11	CERAMIC CHIP	0.1uF		16V
C582	1-162-964-11	CERAMIC CHIP	0.001uF	10%	50V
C583	1-128-004-11	ELECT CHIP	10uF	20%	16V
C584	1-128-004-11	ELECT CHIP	10uF	20%	16V
C586	1-162-918-11	CERAMIC CHIP	18PF	5%	50V
C587	1-162-921-11	CERAMIC CHIP	33PF	5%	50V
C588	1-162-964-11	CERAMIC CHIP	0.001uF	10%	50V
C589	1-164-633-11	CERAMIC CHIP	0.1uF	10%	25V
C590	1-162-964-11	CERAMIC CHIP	0.001uF	10%	50V
C591	1-162-969-11	CERAMIC CHIP	0.0068uF	10%	25V
C592	1-162-969-11	CERAMIC CHIP	0.0068uF	10%	25V
C595	1-162-974-11	CERAMIC CHIP	0.01uF		50V
C701	1-135-149-21	TANTALUM CHIP	2.2uF	20%	10V
C702	1-164-633-11	CERAMIC CHIP	0.1uF	10%	25V
C703	1-162-974-11	CERAMIC CHIP	0.01uF		50V
C705	1-164-360-11	CERAMIC CHIP	0.1uF		16V
C707	1-162-974-11	CERAMIC CHIP	0.01uF		50V
C708	1-162-974-11	CERAMIC CHIP	0.01uF		50V
C709	1-164-346-11	CERAMIC CHIP	1uF		16V
C710	1-162-974-11	CERAMIC CHIP	0.01uF		50V
C711	1-135-181-21	TANTALUM CHIP	4.7uF	20%	6.3V
C712	1-164-360-11	CERAMIC CHIP	0.1uF		16V
C713	1-163-077-00	CERAMIC CHIP	0.1uF	10%	25V

Ref. No.	Part No.	Description			Remarks
C714	1-164-360-11	CERAMIC CHIP	0.1uF		16V
C718	1-164-360-11	CERAMIC CHIP	0.1uF		16V
C719	1-162-974-11	CERAMIC CHIP	0.01uF		50V
C721	1-164-360-11	CERAMIC CHIP	0.1uF		16V
C722	1-162-974-11	CERAMIC CHIP	0.01uF		50V
C724	1-162-974-11	CERAMIC CHIP	0.01uF		50V
C725	1-135-181-21	TANTALUM CHIP	4.7uF	20%	6.3V
C726	1-164-360-11	CERAMIC CHIP	0.1uF		16V
C729	1-164-360-11	CERAMIC CHIP	0.1uF		16V
C733	1-164-360-11	CERAMIC CHIP	0.1uF		16V
C737	1-135-181-21	TANTALUM CHIP	4.7uF	20%	6.3V
C738	1-164-360-11	CERAMIC CHIP	0.1uF		16V
C739	1-162-974-11	CERAMIC CHIP	0.01uF		50V
C741	1-164-360-11	CERAMIC CHIP	0.1uF		16V
C743	1-162-974-11	CERAMIC CHIP	0.01uF		50V
C745	1-162-974-11	CERAMIC CHIP	0.01uF		50V
C749	1-135-181-21	TANTALUM CHIP	4.7uF	20%	6.3V
C751	1-162-974-11	CERAMIC CHIP	0.01uF		50V
C752	1-164-360-11	CERAMIC CHIP	0.1uF		16V
C753	1-162-974-11	CERAMIC CHIP	0.01uF		50V
C754	1-162-946-11	CERAMIC CHIP	27PF	5%	50V
C756	1-162-974-11	CERAMIC CHIP	0.01uF		50V
C758	1-164-360-11	CERAMIC CHIP	0.1uF		16V
C801	1-135-259-11	TANTAL. CHIP	10uF	20%	6.3V
C802	1-162-917-11	CERAMIC CHIP	15PF	5%	50V
C803	1-135-181-21	TANTALUM CHIP	4.7uF	20%	6.3V
C804	1-162-974-11	CERAMIC CHIP	0.01uF		50V
C805	1-162-974-11	CERAMIC CHIP	0.01uF		50V
C806	1-162-964-11	CERAMIC CHIP	0.001uF	10%	50V
C807	1-162-974-11	CERAMIC CHIP	0.01uF		50V
C808	1-135-091-00	TANTALUM CHIP	1uF	20%	16V
C809	1-135-181-21	TANTALUM CHIP	4.7uF	20%	6.3V
C810	1-163-077-00	CERAMIC CHIP	0.1uF	10%	25V
C811	1-164-360-11	CERAMIC CHIP	0.1uF		16V
C813	1-164-360-11	CERAMIC CHIP	0.1uF		16V
C814	1-162-964-11	CERAMIC CHIP	0.001uF	10%	50V
C815	1-135-181-21	TANTALUM CHIP	4.7uF	20%	6.3V
C816	1-162-974-11	CERAMIC CHIP	0.01uF		50V
C817	1-162-974-11	CERAMIC CHIP	0.01uF		50V
C818	1-135-091-00	TANTALUM CHIP	1uF	20%	16V
C819	1-164-360-11	CERAMIC CHIP	0.1uF		16V
C820	1-135-091-00	TANTALUM CHIP	1uF	20%	16V
C821	1-162-947-11	CERAMIC CHIP	33PF	5%	50V
C823	1-135-091-00	TANTALUM CHIP	1uF	20%	16V
C826	1-164-360-11	CERAMIC CHIP	0.1uF		16V
C828	1-163-077-00	CERAMIC CHIP	0.1uF	10%	25V
C831	1-163-077-00	CERAMIC CHIP	0.1uF	10%	25V
C832	1-162-964-11	CERAMIC CHIP	0.001uF	10%	50V
C833	1-162-974-11	CERAMIC CHIP	0.01uF		50V
C834	1-163-077-00	CERAMIC CHIP	0.1uF	10%	25V

Ref. No.	Part No.	Description			Remarks
C835	1-162-974-11	CERAMIC CHIP	0.01uF		50V
C836	1-126-205-11	ELECT CHIP	47uF	20%	6.3V
C837	1-162-974-11	CERAMIC CHIP	0.01uF		50V
C838	1-135-145-11	TANTALUM CHIP	0.47uF	10%	35V
C839	1-162-974-11	CERAMIC CHIP	0.01uF		50V
C840	1-164-337-11	CERAMIC CHIP	2.2uF		16V
C851	1-164-633-11	CERAMIC CHIP	0.1uF	10%	25V
C852	1-162-964-11	CERAMIC CHIP	0.001uF	10%	50V
C853	1-162-638-11	CERAMIC CHIP	1uF		16V
C854	1-162-974-11	CERAMIC CHIP	0.01uF		50V
C855	1-164-360-11	CERAMIC CHIP	0.1uF		16V
C856	1-162-974-11	CERAMIC CHIP	0.01uF		50V
C857	1-164-360-11	CERAMIC CHIP	0.1uF		16V
C858	1-162-974-11	CERAMIC CHIP	0.01uF		50V
C859	1-128-004-11	ELECT CHIP	10uF	20%	16V
C861	1-162-974-11	CERAMIC CHIP	0.01uF		50V
C862	1-162-974-11	CERAMIC CHIP	0.01uF		50V
C863	1-162-974-11	CERAMIC CHIP	0.01uF		50V
C864	1-162-638-11	CERAMIC CHIP	1uF		16V
C865	1-135-165-11	TANTAL. CHIP	33uF	20%	16V
C866	1-164-360-11	CERAMIC CHIP	0.1uF		16V
C868	1-164-360-11	CERAMIC CHIP	0.1uF		16V
C869	1-164-005-11	CERAMIC CHIP	0.47uF		25V
C870	1-164-173-11	CERAMIC CHIP	0.0039uF	10%	50V
C872	1-162-638-11	CERAMIC CHIP	1uF		16V
C875	1-135-259-11	TANTAL. CHIP	10uF	20%	6.3V

< CONNECTOR >

CN001	1-569-775-21	PIN, CONNECTOR 5P
CN002	1-691-492-21	CONNECTOR, FFC/FPC 13P
CN501	1-691-520-11	CONNECTOR, BOARD TO BOARD 48P
CN502	1-691-539-11	CONNECTOR, BOARD TO BOARD 30P
CN503	1-691-530-11	CONNECTOR, BOARD TO BOARD 40P
CN504	1-691-528-11	CONNECTOR, BOARD TO BOARD 28P
CN505	1-691-495-21	CONNECTOR, FFC/FPC 16P
CN506	1-573-326-11	CONNECTOR, BOARD TO BOARD 24P
CN507	1-691-494-21	CONNECTOR, FFC/FPC 15P
CN701	1-573-372-21	CONNECTOR, BOARD TO BOARD 18P
CN801	1-691-475-21	CONNECTOR, BOARD TO BOARD 18P
CN851	1-573-361-11	CONNECTOR, FFC/FPC 21P
CN852	1-566-540-11	CONNECTOR, FPC (NON ZIF) 8P

< TRIMMER >

CT801	1-141-356-11	CAP, ADJ
CT801	1-141-430-51	CAP, CHIP TRIMMER

< DIODE >

Ref. No.	Part No.	Description		Remarks
D501	8-719-421-27	DIODE	MA728	
D503	8-719-110-03	DIODE	RD7.5ES	
D504	8-719-404-35	DIODE	MA141WK	
D505	8-719-404-46	DIODE	MA110	
D507	8-719-404-46	DIODE	MA110	
D510	8-719-110-03	DIODE	RD7.5ES	
D511	8-719-110-03	DIODE	RD7.5ES	
D512	8-719-110-03	DIODE	RD7.5ES	
D513	8-719-110-03	DIODE	RD7.5ES	
D514	8-719-110-03	DIODE	RD7.5ES	
D515	8-719-110-03	DIODE	RD7.5ES	
D516	8-719-110-03	DIODE	RD7.5ES	
D518	8-719-110-03	DIODE	RD7.5ES	
D519	8-719-110-03	DIODE	RD7.5ES	
D520	8-719-110-03	DIODE	RD7.5ES	
D521	8-719-110-03	DIODE	RD7.5ES	
D522	8-719-110-03	DIODE	RD7.5ES	
D523	8-719-110-03	DIODE	RD7.5ES	
D524	8-719-110-03	DIODE	RD7.5ES	
D525	8-719-110-03	DIODE	RD7.5ES	
D801	8-719-110-03	DIODE	RD7.5ES	

< FILTER >

FL701	1-406-452-11	COIL, OSC

< IC >

IC001	8-752-033-38	IC	CXA1202R
IC501	8-759-058-96	IC	TB1206F
IC502	8-759-999-02	IC	TL1596CDB
IC503	8-752-841-67	IC	CXP80624-444Q
IC505	8-759-057-60	IC	MCD004BM
IC506	8-759-158-55	IC	uPD75316GF-354-3B9
IC507	8-759-056-84	IC	S-8420AF
IC509	8-759-145-63	IC	uPD7564G-540
IC510	8-759-039-01	IC	MPC1720M
IC511	8-759-044-78	IC	AK6420F-SGX2060
IC701	8-759-243-19	IC	TC7SU04F
IC702	8-759-635-27	IC	M62352GP
IC703	8-759-069-29	IC	uPD6456GS-618
IC704	8-752-348-92	IC	CXD2101AR
IC705	8-759-063-18	IC	27C512-RCP-V1.0
IC706	8-752-355-56	IC	CXD2104BN-T4
IC707	8-752-337-32	IC	CXD2100Q
IC709	8-752-841-91	IC	CXP80624-455Q
IC712	8-759-159-70	IC	BR9021BF-E2
IC801	8-752-350-16	IC	CXD1257AR-T6
IC802	8-752-056-39	IC	CXA1507BR
IC803	8-752-053-26	IC	CXA1399Q
IC804	8-752-327-48	IC	CXD1250N
IC805	8-752-054-61	IC	CXA1390AR
IC851	8-759-701-24	IC	NJM3414M
IC852	8-759-998-96	IC	LM324D
IC853	8-759-038-81	IC	MPC1724M
IC854	8-759-823-51	IC	LB1830M

Ref. No.	Part No.	Description	Remarks
IC855	8-759-998-98	IC LM358D	

< COIL >

Ref. No.	Part No.	Description	Remarks
L001	1-412-033-11	INDUCTOR CHIP 220uH	
L002	1-412-033-11	INDUCTOR CHIP 220uH	
L003	1-412-033-11	INDUCTOR CHIP 220uH	
L004	1-412-029-11	INDUCTOR CHIP 10uH	
L041	1-412-033-11	INDUCTOR CHIP 220uH	
L042	1-410-381-11	INDUCTOR CHIP 10uH	
L501	1-412-029-11	INDUCTOR CHIP 10uH	
L502	1-412-029-11	INDUCTOR CHIP 10uH	
L503	1-412-028-11	INDUCTOR CHIP 4.7uH	
L504	1-412-028-11	INDUCTOR CHIP 4.7uH	
L506	1-412-029-11	INDUCTOR CHIP 10uH	
L703	1-412-006-31	INDUCTOR CHIP 10uH	
L704	1-412-006-31	INDUCTOR CHIP 10uH	
L706	1-412-029-11	INDUCTOR CHIP 10uH	
L714	1-412-011-31	INDUCTOR CHIP 27uH	
L715	1-412-029-11	INDUCTOR CHIP 10uH	
L716	1-412-026-11	INDUCTOR CHIP 1uH	
L717	1-412-029-11	INDUCTOR CHIP 10uH	
L719	1-412-006-31	INDUCTOR CHIP 10uH	
L722	1-412-006-31	INDUCTOR CHIP 10uH	
L723	1-410-391-11	INDUCTOR CHIP 68uH	
L730	1-412-026-11	INDUCTOR CHIP 1uH	
L731	1-412-026-11	INDUCTOR CHIP 1uH	
L732	1-412-026-11	INDUCTOR CHIP 1uH	
L733	1-412-979-21	INDUCTOR 1uH	
L734	1-412-979-21	INDUCTOR 1uH	
L801	1-412-029-11	INDUCTOR CHIP 10uH	
L802	1-412-006-31	INDUCTOR CHIP 10uH	
L803	1-412-029-11	INDUCTOR CHIP 10uH	
L804	1-412-029-11	INDUCTOR CHIP 10uH	
L851	1-412-029-11	INDUCTOR CHIP 10uH	
L852	1-410-993-11	INDUCTOR CHIP 1uH	
L853	1-412-029-11	INDUCTOR CHIP 10uH	

< IC LINK >

Ref. No.	Part No.	Description	Remarks
⚠PS501	1-576-123-21	RINK, IC	
⚠PS502	1-576-123-21	RINK, IC	

< TRANSISTOR >

Ref. No.	Part No.	Description	Remarks
Q002	8-729-230-63	TRANSISTOR 2SC4116-YG	
Q003	8-729-403-35	TRANSISTOR UN5113	
Q041	8-729-230-60	TRANSISTOR 2SA1586-YG	
Q042	8-729-014-16	TRANSISTOR RN2302-TE85L	
Q043	8-729-216-22	TRANSISTOR 2SA1162	
Q501	8-729-013-88	TRANSISTOR RN1302-TE85L	
Q504	8-729-402-48	TRANSISTOR UN521E-TX	
Q505	8-729-230-60	TRANSISTOR 2SA1586-YG	
Q507	8-729-403-35	TRANSISTOR UN5113	
Q509	8-729-822-84	TRANSISTOR 2SB1202FAST	
Q512	8-729-230-63	TRANSISTOR 2SC4116-YG	
Q702	8-729-402-84	TRANSISTOR XN4601	
Q703	8-729-230-60	TRANSISTOR 2SA1586-YG	
Q704	8-729-230-60	TRANSISTOR 2SA1586-YG	
Q707	8-729-230-63	TRANSISTOR 2SC4116-YG	
Q708	8-729-014-16	TRANSISTOR RN2302-TE85L	
Q709	8-729-402-45	TRANSISTOR UN5212	
Q801	8-729-423-55	TRANSISTOR 2SC3931-D	
Q802	8-729-403-27	TRANSISTOR XN4401	
Q851	8-729-230-63	TRANSISTOR 2SC4116-YG	
Q853	8-729-403-27	TRANSISTOR XN4401	
Q854	8-729-230-63	TRANSISTOR 2SC4116-YG	

< RESISTOR >

Ref. No.	Part No.	Description	Remarks
R001	1-216-823-11	METAL CHIP 1.5K 5% 1/16W	
R003	1-216-837-11	METAL CHIP 22K 5% 1/16W	
R004	1-216-838-11	METAL CHIP 27K 5% 1/16W	
R005	1-216-835-11	METAL CHIP 15K 5% 1/16W	
R006	1-216-791-11	METAL CHIP 3.3 5% 1/16W	
R007	1-216-838-11	METAL CHIP 27K 5% 1/16W	
R008	1-216-838-11	METAL CHIP 27K 5% 1/16W	
R009	1-216-841-11	METAL CHIP 47K 5% 1/16W	
R011	1-216-838-11	METAL CHIP 27K 5% 1/16W	
R012	1-216-837-11	METAL CHIP 22K 5% 1/16W	
R013	1-216-823-11	METAL CHIP 1.5K 5% 1/16W	
R014	1-216-791-11	METAL CHIP 3.3 5% 1/16W	
R015	1-216-841-11	METAL CHIP 47K 5% 1/16W	
R016	1-216-832-11	METAL CHIP 8.2K 5% 1/16W	
R017	1-216-837-11	METAL CHIP 22K 5% 1/16W	
R018	1-216-832-11	METAL CHIP 8.2K 5% 1/16W	
R019	1-216-823-11	METAL CHIP 1.5K 5% 1/16W	
R020	1-216-831-11	METAL CHIP 6.8K 5% 1/16W	
R021	1-216-828-11	METAL CHIP 3.9K 5% 1/16W	
R022	1-216-864-11	METAL CHIP 0 5% 1/16W	
R023	1-216-821-11	METAL CHIP 1K 5% 1/16W	
R024	1-216-815-11	METAL CHIP 330 5% 1/16W	
R026	1-216-817-11	METAL CHIP 470 5% 1/16W	
R041	1-216-837-11	METAL CHIP 22K 5% 1/16W	
R042	1-216-839-11	METAL CHIP 33K 5% 1/16W	
R043	1-216-814-11	METAL CHIP 270 5% 1/16W	
R044	1-216-814-11	METAL CHIP 270 5% 1/16W	
R045	1-216-803-11	METAL CHIP 33 5% 1/16W	
R046	1-216-806-11	METAL GLAZE 56 5% 1/16W	
R047	1-216-818-11	METAL CHIP 560 5% 1/16W	
R501	1-216-839-11	METAL CHIP 33K 5% 1/16W	
R502	1-216-837-11	METAL CHIP 22K 5% 1/16W	
R503	1-216-837-11	METAL CHIP 22K 5% 1/16W	
R504	1-216-845-11	METAL CHIP 100K 5% 1/16W	
R505	1-216-817-11	METAL CHIP 470 5% 1/16W	

Note: The components identified by mark ⚠ or dotted line with mark ⚠ are critical for safety.
Replace only with part number specified.

Ref. No.	Part No.	Description				Remarks
R506	1-216-852-11	METAL CHIP	390K	5%	1/16W	
R507	1-216-849-11	METAL CHIP	220K	5%	1/16W	
R508	1-218-863-11	METAL CHIP	4.7K	0.50%	1/16W	
R509	1-218-879-11	METAL CHIP	22K	0.50%	1/16W	
R510	1-216-845-11	METAL CHIP	100K	5%	1/16W	
R511	1-216-833-11	METAL CHIP	10K	5%	1/16W	
R512	1-216-829-11	METAL CHIP	4.7K	5%	1/16W	
R513	1-216-845-11	METAL CHIP	100K	5%	1/16W	
R514	1-216-857-11	METAL CHIP	1M	5%	1/16W	
R515	1-216-841-11	METAL CHIP	47K	5%	1/16W	
R516	1-216-841-11	METAL CHIP	47K	5%	1/16W	
R517	1-216-833-11	METAL CHIP	10K	5%	1/16W	
R520	1-216-833-11	METAL CHIP	10K	5%	1/16W	
R521	1-216-841-11	METAL CHIP	47K	5%	1/16W	
R522	1-216-837-11	METAL CHIP	22K	5%	1/16W	
R523	1-216-837-11	METAL CHIP	22K	5%	1/16W	
R524	1-216-845-11	METAL CHIP	100K	5%	1/16W	
R526	1-216-833-11	METAL CHIP	10K	5%	1/16W	
R527	1-216-833-11	METAL CHIP	10K	5%	1/16W	
R528	1-216-821-11	METAL CHIP	1K	5%	1/16W	
R530	1-216-813-11	METAL CHIP	220	5%	1/16W	
R531	1-216-864-11	METAL CHIP	0	5%	1/16W	
R532	1-216-833-11	METAL CHIP	10K	5%	1/16W	
R533	1-216-827-11	METAL CHIP	3.3K	5%	1/16W	
R534	1-216-821-11	METAL CHIP	1K	5%	1/16W	
R536	1-216-821-11	METAL CHIP	1K	5%	1/16W	
R537	1-216-845-11	METAL CHIP	100K	5%	1/16W	
R538	1-216-833-11	METAL CHIP	10K	5%	1/16W	
R539	1-216-821-11	METAL CHIP	1K	5%	1/16W	
R545	1-216-027-00	METAL CHIP	120	5%	1/10W	
R547	1-216-827-11	METAL CHIP	3.3K	5%	1/16W	
R548	1-216-833-11	METAL CHIP	10K	5%	1/16W	
R549	1-217-671-11	METAL CHIP	1	5%	1/10W	
R550	1-217-671-11	METAL CHIP	1	5%	1/10W	
R551	1-217-671-11	METAL CHIP	1	5%	1/10W	
R552	1-217-671-11	METAL CHIP	1	5%	1/10W	
R553	1-216-845-11	METAL CHIP	100K	5%	1/16W	
R555	1-216-838-11	METAL CHIP	27K	5%	1/16W	
R556	1-216-821-11	METAL CHIP	1K	5%	1/16W	
R557	1-216-838-11	METAL CHIP	27K	5%	1/16W	
R558	1-216-821-11	METAL CHIP	1K	5%	1/16W	
R559	1-216-838-11	METAL CHIP	27K	5%	1/16W	
R560	1-216-864-11	METAL CHIP	0	5%	1/16W	
R562	1-216-833-11	METAL CHIP	10K	5%	1/16W	
R563	1-216-833-11	METAL CHIP	10K	5%	1/16W	
R564	1-216-851-11	METAL CHIP	330K	5%	1/16W	
R565	1-216-837-11	METAL CHIP	22K	5%	1/16W	
R566	1-216-841-11	METAL CHIP	47K	5%	1/16W	
R568	1-216-833-11	METAL CHIP	10K	5%	1/16W	
R569	1-216-817-11	METAL CHIP	470	5%	1/16W	

Ref. No.	Part No.	Description				Remarks
R570	1-216-845-11	METAL CHIP	100K	5%	1/16W	
R571	1-216-821-11	METAL CHIP	1K	5%	1/16W	
R572	1-216-821-11	METAL CHIP	1K	5%	1/16W	
R573	1-216-827-11	METAL CHIP	3.3K	5%	1/16W	
R574	1-216-821-11	METAL CHIP	1K	5%	1/16W	
R575	1-216-851-11	METAL CHIP	330K	5%	1/16W	
R576	1-216-864-11	METAL CHIP	0	5%	1/16W	
R577	1-216-821-11	METAL CHIP	1K	5%	1/16W	
R578	1-216-841-11	METAL CHIP	47K	5%	1/16W	
R579	1-216-829-11	METAL CHIP	4.7K	5%	1/16W	
R580	1-216-845-11	METAL CHIP	100K	5%	1/16W	
R581	1-216-841-11	METAL CHIP	47K	5%	1/16W	
R582	1-216-821-11	METAL CHIP	1K	5%	1/16W	
R583	1-216-821-11	METAL CHIP	1K	5%	1/16W	
R584	1-216-833-11	METAL CHIP	10K	5%	1/16W	
R585	1-216-837-11	METAL CHIP	22K	5%	1/16W	
R587	1-216-841-11	METAL CHIP	47K	5%	1/16W	
R588	1-216-841-11	METAL CHIP	47K	5%	1/16W	
R589	1-216-845-11	METAL CHIP	100K	5%	1/16W	
R590	1-216-831-11	METAL CHIP	6.8K	5%	1/16W	
R591	1-216-845-11	METAL CHIP	100K	5%	1/16W	
R592	1-216-845-11	METAL CHIP	100K	5%	1/16W	
R594	1-216-833-11	METAL CHIP	10K	5%	1/16W	
R596	1-216-821-11	METAL CHIP	1K	5%	1/16W	
R600	1-216-809-11	METAL CHIP	100	5%	1/16W	
R601	1-216-826-11	METAL CHIP	2.7K	5%	1/16W	
R603	1-216-845-11	METAL CHIP	100K	5%	1/16W	
R606	1-216-841-11	METAL CHIP	47K	5%	1/16W	
R607	1-216-295-00	METAL CHIP	0	5%	1/10W	
R608	1-216-295-00	METAL CHIP	0	5%	1/10W	
R609	1-216-821-11	METAL CHIP	1K	5%	1/16W	
R611	1-216-864-11	METAL CHIP	0	5%	1/16W	
R613	1-216-841-11	METAL CHIP	47K	5%	1/16W	
R614	1-216-841-11	METAL CHIP	47K	5%	1/16W	
R615	1-216-835-11	METAL CHIP	15K	5%	1/16W	
R701	1-216-857-11	METAL CHIP	1M	5%	1/16W	
R702	1-216-821-11	METAL CHIP	1K	5%	1/16W	
R703	1-216-837-11	METAL CHIP	22K	5%	1/16W	
R704	1-216-815-11	METAL CHIP	330	5%	1/16W	
R705	1-216-833-11	METAL CHIP	10K	5%	1/16W	
R707	1-216-825-11	METAL CHIP	2.2K	5%	1/16W	
R708	1-216-845-11	METAL CHIP	100K	5%	1/16W	
R709	1-216-839-11	METAL CHIP	33K	5%	1/16W	
R712	1-216-821-11	METAL CHIP	1K	5%	1/16W	
R713	1-216-821-11	METAL CHIP	1K	5%	1/16W	
R714	1-216-821-11	METAL CHIP	1K	5%	1/16W	
R715	1-216-821-11	METAL CHIP	1K	5%	1/16W	
R718	1-216-825-11	METAL CHIP	2.2K	5%	1/16W	
R720	1-216-864-11	METAL CHIP	0	5%	1/16W	
R722	1-216-821-11	METAL CHIP	1K	5%	1/16W	

Ref. No.	Part No.	Description			Remarks
R724	1-216-821-11	METAL CHIP	1K	5%	1/16W
R727	1-216-821-11	METAL CHIP	1K	5%	1/16W
R728	1-216-821-11	METAL CHIP	1K	5%	1/16W
R729	1-216-821-11	METAL CHIP	1K	5%	1/16W
R730	1-216-864-11	METAL CHIP	0	5%	1/16W
R732	1-216-821-11	METAL CHIP	1K	5%	1/16W
R733	1-216-822-11	METAL CHIP	1.2K	5%	1/16W
R734	1-216-817-11	METAL CHIP	470	5%	1/16W
R735	1-216-834-11	METAL CHIP	12K	5%	1/16W
R736	1-216-827-11	METAL CHIP	3.3K	5%	1/16W
R737	1-216-813-11	METAL CHIP	220	5%	1/16W
R738	1-216-825-11	METAL CHIP	2.2K	5%	1/16W
R739	1-216-833-11	METAL CHIP	10K	5%	1/16W
R740	1-216-841-11	METAL CHIP	47K	5%	1/16W
R741	1-216-864-11	METAL CHIP	0	5%	1/16W
R742	1-216-821-11	METAL CHIP	1K	5%	1/16W
R743	1-216-295-00	METAL CHIP	0	5%	1/10W
R744	1-216-295-00	METAL CHIP	0	5%	1/10W
R745	1-216-827-11	METAL CHIP	3.3K	5%	1/16W
R747	1-216-864-11	METAL CHIP	0	5%	1/16W
R749	1-216-841-11	METAL CHIP	47K	5%	1/16W
R752	1-216-816-11	METAL CHIP	390	5%	1/16W
R753	1-216-834-11	METAL CHIP	12K	5%	1/16W
R754	1-216-821-11	METAL CHIP	1K	5%	1/16W
R755	1-216-833-11	METAL CHIP	10K	5%	1/16W
R756	1-216-857-11	METAL CHIP	1M	5%	1/16W
R757	1-216-857-11	METAL CHIP	1M	5%	1/16W
R758	1-216-841-11	METAL CHIP	47K	5%	1/16W
R759	1-216-821-11	METAL CHIP	1K	5%	1/16W
R760	1-216-857-11	METAL CHIP	1M	5%	1/16W
R763	1-216-833-11	METAL CHIP	10K	5%	1/16W
R764	1-216-839-11	METAL CHIP	33K	5%	1/16W
R765	1-216-814-11	METAL CHIP	270	5%	1/16W
R766	1-216-833-11	METAL CHIP	10K	5%	1/16W
R767	1-216-833-11	METAL CHIP	10K	5%	1/16W
R769	1-216-833-11	METAL CHIP	10K	5%	1/16W
R770	1-216-825-11	METAL CHIP	2.2K	5%	1/16W
R772	1-216-864-11	METAL CHIP	0	5%	1/16W
R773	1-216-864-11	METAL CHIP	0	5%	1/16W
R774	1-216-841-11	METAL CHIP	47K	5%	1/16W
R775	1-216-821-11	METAL CHIP	1K	5%	1/16W
R777	1-216-833-11	METAL CHIP	10K	5%	1/16W
R778	1-216-833-11	METAL CHIP	10K	5%	1/16W
R783	1-216-825-11	METAL CHIP	2.2K	5%	1/16W
R784	1-216-833-11	METAL CHIP	10K	5%	1/16W
R785	1-216-833-11	METAL CHIP	10K	5%	1/16W
R787	1-216-821-11	METAL CHIP	1K	5%	1/16W
R788	1-216-825-11	METAL CHIP	2.2K	5%	1/16W
R789	1-216-821-11	METAL CHIP	1K	5%	1/16W
R793	1-216-823-11	METAL CHIP	1.5K	5%	1/16W

Ref. No.	Part No.	Description			Remarks
R794	1-216-841-11	METAL CHIP	47K	5%	1/16W
R795	1-216-841-11	METAL CHIP	47K	5%	1/16W
R796	1-216-825-11	METAL CHIP	2.2K	5%	1/16W
R797	1-216-825-11	METAL CHIP	2.2K	5%	1/16W
R799	1-216-821-11	METAL CHIP	1K	5%	1/16W
R802	1-216-835-11	METAL CHIP	15K	5%	1/16W
R804	1-216-833-11	METAL CHIP	10K	5%	1/16W
R805	1-216-845-11	METAL CHIP	100K	5%	1/16W
R808	1-216-801-11	METAL CHIP	22	5%	1/16W
R810	1-216-825-11	METAL CHIP	2.2K	5%	1/16W
R811	1-216-833-11	METAL CHIP	10K	5%	1/16W
R812	1-216-825-11	METAL CHIP	2.2K	5%	1/16W
R813	1-216-825-11	METAL CHIP	2.2K	5%	1/16W
R814	1-216-823-11	METAL CHIP	1.5K	5%	1/16W
R815	1-216-819-11	METAL CHIP	680	5%	1/16W
R816	1-216-824-11	METAL CHIP	1.8K	5%	1/16W
R819	1-216-805-11	METAL CHIP	47	5%	1/16W
R823	1-218-876-11	METAL CHIP	16K	0.50%	1/16W
R825	1-216-832-11	METAL CHIP	8.2K	5%	1/16W
R826	1-216-837-11	METAL CHIP	22K	5%	1/16W
R828	1-218-847-11	METAL CHIP	1K	0.50%	1/16W
R836	1-216-863-11	METAL GLAZE	3.3M	5%	1/16W
R851	1-216-837-11	METAL CHIP	22K	5%	1/16W
R852	1-216-821-11	METAL CHIP	1K	5%	1/16W
R853	1-216-828-11	METAL CHIP	3.9K	5%	1/16W
R854	1-216-833-11	METAL CHIP	10K	5%	1/16W
R855	1-216-826-11	METAL CHIP	2.7K	5%	1/16W
R857	1-216-848-11	METAL CHIP	180K	5%	1/16W
R859	1-216-845-11	METAL CHIP	100K	5%	1/16W
R860	1-216-833-11	METAL CHIP	10K	5%	1/16W
R861	1-216-833-11	METAL CHIP	10K	5%	1/16W
R862	1-216-848-11	METAL CHIP	180K	5%	1/16W
R863	1-216-855-11	METAL CHIP	680K	5%	1/16W
R864	1-216-833-11	METAL CHIP	10K	5%	1/16W
R865	1-218-879-11	METAL CHIP	22K	0.50%	1/16W
R866	1-216-820-11	METAL CHIP	820	5%	1/16W
R867	1-216-837-11	METAL CHIP	22K	5%	1/16W
R868	1-216-833-11	METAL CHIP	10K	5%	1/16W
R869	1-218-744-11	METAL CHIP	150K	0.50%	1/16W
R870	1-216-841-11	METAL CHIP	47K	5%	1/16W
R871	1-218-871-11	METAL CHIP	10K	0.50%	1/16W
R872	1-216-851-11	METAL CHIP	330K	5%	1/16W
R873	1-216-816-11	METAL CHIP	390	5%	1/16W
R874	1-216-842-11	METAL CHIP	56K	5%	1/16W
R875	1-216-134-00	METAL CHIP	2.2	5%	1/8W
R876	1-216-829-11	METAL CHIP	4.7K	5%	1/16W
R877	1-218-881-11	METAL CHIP	27K	0.50%	1/16W
R878	1-216-843-11	METAL CHIP	68K	5%	1/16W
R879	1-216-837-11	METAL CHIP	22K	5%	1/16W
R880	1-216-841-11	METAL CHIP	47K	5%	1/16W

Ref. No.	Part No.	Description	Remarks
R881	1-216-833-11	METAL CHIP 10K 5% 1/16W	
R884	1-216-837-11	METAL CHIP 22K 5% 1/16W	
R885	1-216-827-11	METAL CHIP 3.3K 5% 1/16W	
		< CONPOSITION CIRCUIT BLOCK >	
RB501	1-236-412-11	NETWORK, RES 1.0K	
RB502	1-236-424-11	NETWORK, RES 10K	
RB503	1-236-412-11	NETWORK, RES 1.0K	
RB504	1-236-442-11	NETWORK, RES 330K	
RB505	1-236-428-11	NETWORK, RES 22K	
RB506	1-236-424-11	NETWORK, RES 10K	
RB507	1-236-412-11	NETWORK, RES 1.0K	
RB509	1-236-904-11	RESISTOR, NETWORK (CHIP TYPE) 1K	
RB512	1-236-424-11	NETWORK, RES 10K	
RB513	1-236-432-11	NETWORK, RES 47K	
RB516	1-236-904-11	RESISTOR, NETWORK (CHIP TYPE) 1K	
RB517	1-236-436-11	NETWORK, RES 100K	
RB518	1-236-907-11	RESISTOR, NETWORK (CHIP TYPE) 100K	
RB519	1-236-908-11	RESISTOR, NETWORK (CHIP TYPE) 10K	
RB520	1-236-412-11	NETWORK, RES 1.0K	
RB522	1-236-424-11	NETWORK, RES 10K	
RB523	1-236-424-11	NETWORK, RES 10K	
RB524	1-236-442-11	NETWORK, RES 330K	
RB525	1-236-432-11	NETWORK, RES 47K	
RB526	1-236-408-11	NETWORK, RES 470	
RB527	1-236-432-11	NETWORK, RES 47K	
RB528	1-236-432-11	NETWORK, RES 47K	
RB529	1-236-428-11	NETWORK, RES 22K	
RB530	1-236-428-11	NETWORK, RES 22K	
RB702	1-236-432-11	NETWORK, RES 47K	
RB705	1-236-416-11	NETWORK, RES 2.2K	
RB708	1-236-416-11	NETWORK, RES 2.2K	
RB709	1-236-416-11	NETWORK, RES 2.2K	
RB710	1-236-412-11	NETWORK, RES 1.0K	
RB711	1-236-412-11	NETWORK, RES 1.0K	
RB712	1-236-412-11	NETWORK, RES 1.0K	
RB713	1-236-412-11	NETWORK, RES 1.0K	
RB714	1-236-412-11	NETWORK, RES 1.0K	
RB740	1-236-432-11	NETWORK, RES 47K	
		< VIBRATOR >	
X501	1-579-367-21	VIBRATOR, CRYSTAL 11.89MHz	
X502	1-579-550-11	VIBRATOR, CRYSTAL 32kHz	
X503	1-578-713-21	VIBLATOR, CERAMIC 4.19MHz	
X504	1-579-551-11	VIBRATOR, CERAMIC 700kHz	
X701	1-579-553-11	VIBRATOR	
X801	1-579-363-11	VIBRATOR, CRYSTAL 28.63636MHz	

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Ref. No.	Part No.	Description	Remarks
	A-7071-807-A	DK-27 BOARD, COMPLETE	
		**********************	
			(Ref. No. 8,000 Series)
		< SWITCH >	
S561	1-572-938-21	SWITCH, TACTIL (COUNTER RESET)	
S562	1-572-938-21	SWITCH, TACTIL (ZERO MEM)	
S563	1-572-938-21	SWITCH, TACTIL (TAPE/BATT CHECK)	
		< FLAT CABLE >	
W564	1-643-081-11	FP-492 FLEXIBLE BOARD	

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Ref. No.	Part No.	Description	Remarks
	A-7071-809-A	FK-58 BOARD, COMPLETE	
		**********************	
			(Ref. No. 10,000 Series)
		< CONNECTOR >	
CN565	1-691-483-21	CONNECTOR, FFC/FPC 4P	
		< SWITCH >	
S560	1-692-111-11	SWITCH, KEY BOARD	
	1-641-639-13	FP-442 FLEXIBLE BOARD	
S001	1-572-986-11	SWTICH, ROTARY (ENCODER)	
S005	1-570-771-21	SWITCH (C DOWN)	

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Ref. No.	Part No.	Description	Remarks
		LM-40 BOARD, COMPLETE	
		**********************	
			(Ref. No. 12,000 Series)
	1-568-323-11	CONNECTOR, BOARD TO BOARD 4P	

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Ref. No.	Part No.	Description	Remarks
		LS-33 BOARD, COMPLETE	
		**********************	
			(Ref. No. 13,000 Series)
		< DIODE >	
D001	8-719-989-52	DIODE GL4600S	
		< TRANSISTOR >	
Q001	8-729-012-46	TRANSISTOR PT4600FS	
Q002	8-729-012-46	TRANSISTOR PT4600FS	
		< RESISTOR >	
R003	1-216-033-00	METAL CHIP 220 5% 1/10W	
R004	1-216-033-00	METAL CHIP 220 5% 1/10W	
R010	1-216-033-00	METAL CHIP 220 5% 1/10W	
R011	1-216-033-00	METAL CHIP 220 5% 1/10W	

< SWITCH >

Ref. No.	Part No.	Description	Remarks
S002	1-572-987-11	SWITCH, PUSH (3 KEY)	

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A-7063-550-A MA-168 BOARD, COMPLETE
`**********************`

(Ref. No. 3,000 Series)

< CAPACITOR >

Ref. No.	Part No.	Description			Remarks
C801	1-162-964-11	CERAMIC CHIP	0.001uF	10%	50V
C802	1-164-004-11	CERAMIC CHIP	0.1uF	10%	25V
C803	1-164-004-11	CERAMIC CHIP	0.1uF	10%	25V
C804	1-135-091-00	TANTALUM CHIP	1uF	20%	16V
C805	1-165-176-11	CERAMIC CHIP	0.047uF	10%	16V
C806	1-164-004-11	CERAMIC CHIP	0.1uF	10%	25V
C807	1-162-970-11	CERAMIC CHIP	0.01uF	10%	25V
C808	1-162-968-11	CERAMIC CHIP	0.0047uF	10%	50V
C809	1-164-227-11	CERAMIC CHIP	0.022uF	10%	25V
C810	1-164-227-11	CERAMIC CHIP	0.022uF	10%	25V
C811	1-164-227-11	CERAMIC CHIP	0.022uF	10%	25V
C813	1-162-964-11	CERAMIC CHIP	0.001uF	10%	50V
C814	1-162-957-11	CERAMIC CHIP	220PF	5%	50V
C831	1-162-964-11	CERAMIC CHIP	0.001uF	10%	50V
C832	1-164-004-11	CERAMIC CHIP	0.1uF	10%	25V
C833	1-164-004-11	CERAMIC CHIP	0.1uF	10%	25V
C834	1-135-091-00	TANTALUM CHIP	1uF	20%	16V
C835	1-165-176-11	CERAMIC CHIP	0.047uF	10%	16V
C836	1-164-004-11	CERAMIC CHIP	0.1uF	10%	25V
C837	1-162-970-11	CERAMIC CHIP	0.01uF	10%	25V
C838	1-162-968-11	CERAMIC CHIP	0.0047uF	10%	50V
C839	1-164-227-11	CERAMIC CHIP	0.022uF	10%	25V
C840	1-164-227-11	CERAMIC CHIP	0.022uF	10%	25V
C841	1-164-227-11	CERAMIC CHIP	0.022uF	10%	25V
C843	1-162-964-11	CERAMIC CHIP	0.001uF	10%	50V
C844	1-162-957-11	CERAMIC CHIP	220PF	5%	50V
C868	1-163-809-11	CERAMIC CHIP	0.047uF	10%	25V
C869	1-163-809-11	CERAMIC CHIP	0.047uF	10%	25V
C881	1-164-360-11	CERAMIC CHIP	0.1uF		16V
C882	1-135-161-21	TANTALUM CHIP	22uF	10%	10V
C883	1-162-964-11	CERAMIC CHIP	0.001uF	10%	50V
C891	1-162-638-11	CERAMIC CHIP	1uF		16V

< CONNECTOR >

Ref. No.	Part No.	Description	Remarks
CN801	1-580-057-11	PIN, CONNECTOR 4P	
CN831	1-580-057-11	PIN, CONNECTOR 4P	

< DIODE >

Ref. No.	Part No.	Description	
D831	8-719-110-03	DIODE	RD7.5ES
D832	8-719-110-03	DIODE	RD7.5ES
D881	8-719-404-46	DIODE	MA110

< IC >

Ref. No.	Part No.	Description	
IC801	8-759-084-53	IC	CXA1618AN-E2
IC891	8-749-923-29	IC	RS-20E-T

< JACK >

Ref. No.	Part No.	Description	Remarks
J801	1-691-737-11	JACK, SMALL (MIC(PLUG IN POWER))	

< COIL >

Ref. No.	Part No.	Description	Remarks
L801	1-412-979-21	INDUCTOR 1uH	
L803	1-412-979-21	INDUCTOR 1uH	
L831	1-412-979-21	INDUCTOR 1uH	

< TRANSISTOR >

Ref. No.	Part No.	Description	
Q801	8-729-230-63	TRANSISTOR	2SC4116-YG

< RESISTOR >

Ref. No.	Part No.	Description			Remarks
R801	1-216-820-11	METAL CHIP	820	5%	1/16W
R802	1-216-831-11	METAL CHIP	6.8K	5%	1/16W
R803	1-216-827-11	METAL CHIP	3.3K	5%	1/16W
R804	1-216-833-11	METAL CHIP	10K	5%	1/16W
R805	1-216-830-11	METAL CHIP	5.6K	5%	1/16W
R806	1-216-830-11	METAL CHIP	5.6K	5%	1/16W
R807	1-216-295-00	METAL CHIP	0	5%	1/10W
R808	1-216-833-11	METAL CHIP	10K	5%	1/16W
R809	1-218-292-11	METAL GLAZE	20K	5%	1/16W
R810	1-216-824-11	METAL CHIP	1.8K	5%	1/16W
R811	1-216-834-11	METAL CHIP	12K	5%	1/16W
R812	1-216-839-11	METAL CHIP	33K	5%	1/16W
R814	1-216-823-11	METAL CHIP	1.5K	5%	1/16W
R815	1-216-823-11	METAL CHIP	1.5K	5%	1/16W
R831	1-216-820-11	METAL CHIP	820	5%	1/16W
R832	1-216-831-11	METAL CHIP	6.8K	5%	1/16W
R833	1-216-827-11	METAL CHIP	3.3K	5%	1/16W
R834	1-216-833-11	METAL CHIP	10K	5%	1/16W
R835	1-216-830-11	METAL CHIP	5.6K	5%	1/16W
R836	1-216-830-11	METAL CHIP	5.6K	5%	1/16W
R837	1-216-295-00	METAL CHIP	0	5%	1/10W
R838	1-216-833-11	METAL CHIP	10K	5%	1/16W
R839	1-218-292-11	METAL GLAZE	20K	5%	1/16W
R840	1-216-824-11	METAL CHIP	1.8K	5%	1/16W
R841	1-216-834-11	METAL CHIP	12K	5%	1/16W
R842	1-216-839-11	METAL CHIP	33K	5%	1/16W
R870	1-216-814-11	METAL CHIP	270	5%	1/16W
R871	1-216-814-11	METAL CHIP	270	5%	1/16W
R891	1-216-296-00	METAL CHIP	0	5%	1/8W
R892	1-218-330-11	METAL GLAZE	11K	5%	1/16W
R895	1-216-833-11	METAL CHIP	10K	5%	1/16W

Ref. No.	Part No.	Description	Remarks

< FLAT CABLE >

W861	1-690-773-11	CABLE, FLAT (FFC-53) 9P	

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A-7071-804-A PJ-55 BOARD, COMPLETE
****
(Ref.No.5,000 Series)

< BUZZER >

BZ550	1-529-107-11	BUZZER, PIEZOELECTRIC

< CAPACITOR >

C550	1-162-964-11	CERAMIC CHIP	0.001uF	10%	50V
C551	1-162-964-11	CERAMIC CHIP	0.001uF	10%	50V
C555	1-162-964-11	CERAMIC CHIP	0.001uF	10%	50V

< DIODE >

D550	8-719-820-05	DIODE	1SS181
D551	8-719-404-46	DIODE	MA110
D552	8-719-404-46	DIODE	MA110
D553	8-719-110-03	DIODE	RD7.5ES
D554	8-719-110-03	DIODE	RD7.5ES
D555	8-719-110-03	DIODE	RD7.5ES
D557	8-719-110-03	DIODE	RD7.5ES
D558	8-719-110-03	DIODE	RD7.5ES
D559	8-719-110-03	DIODE	RD7.5ES
D574	8-719-110-03	DIODE	RD7.5ES

< RESISTOR >

R551	1-216-845-11	METAL CHIP	100K	5%	1/16W
R552	1-216-295-00	METAL CHIP	0	5%	1/10W
R553	1-216-150-00	METAL GLAZE	10	5%	1/8W
R555	1-216-864-11	METAL CHIP	0	5%	1/16W

< SWITCH >

S550	1-571-275-41	SWITCH, SLIDE (EDIT)
S551	1-571-674-11	SWITCH, SLIDE (OUT IN)
S552	1-572-283-11	SWITCH, SLIDE (HI-FI SOUND)

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A-7071-808-A PK-37 BOARD, COMPLETE
****
(Ref.No.9,000 Series)

< CONNECTOR >

CN540	1-691-485-21	CONNECTOR, FFC/FPC 6P

< DIODE >

D540	8-719-820-05	DIODE	1SS181

Ref. No.	Part No.	Description	Remarks

< SWITCH >

S540	1-572-283-11	SWITCH, SLIDE (POWER)
S541	1-571-275-41	SWITCH, SLIDE (BEEP)
S542	1-571-275-41	SWITCH, SLIDE (REMOTE COMMANDER)

****

A-7063-546-A PS-312 BOARD, COMPLETE
****
(Ref.No.3,000 Series)

< CAPACITOR >

C950	1-164-633-11	CERAMIC CHIP	0.1uF	10%	25V
C951	1-164-384-11	CERAMIC CHIP	130PF	5%	50V
C952	1-162-965-11	CERAMIC CHIP	0.0015uF	10%	50V
C953	1-162-965-11	CERAMIC CHIP	0.0015uF	10%	50V
C954	1-164-633-11	CERAMIC CHIP	0.1uF	10%	25V
C957	1-164-227-11	CERAMIC CHIP	0.022uF	10%	25V
C958	1-162-965-11	CERAMIC CHIP	0.0015uF	10%	50V
C959	1-164-227-11	CERAMIC CHIP	0.022uF	10%	25V
C960	1-164-730-11	CERAMIC CHIP	0.0012uF	5%	50V
C961	1-164-633-11	CERAMIC CHIP	0.1uF	10%	25V
C962	1-164-633-11	CERAMIC CHIP	0.1uF	10%	25V
C963	1-162-964-11	CERAMIC CHIP	0.001uF	10%	50V
C965	1-162-964-11	CERAMIC CHIP	0.001uF	10%	50V
C966	1-162-964-11	CERAMIC CHIP	0.001uF	10%	50V
C968	1-162-964-11	CERAMIC CHIP	0.001uF	10%	50V
C969	1-162-957-11	CERAMIC CHIP	220PF	5%	50V
C970	1-162-963-11	CERAMIC CHIP	680PF	10%	50V
C971	1-162-928-11	CERAMIC CHIP	120PF	5%	50V
C972	1-162-928-11	CERAMIC CHIP	120PF	5%	50V
C973	1-128-530-11	ELECT CHIP	33uF	20%	10V
C974	1-128-004-11	ELECT CHIP	10uF	20%	16V
C975	1-127-558-11	ELECT(SOLID)	10uF	20%	10V
C976	1-128-004-11	ELECT CHIP	10uF	20%	16V
C977	1-127-558-11	ELECT(SOLID)	10uF	20%	10V
C978	1-164-337-11	CERAMIC CHIP	2.2uF		16V
C979	1-164-337-11	CERAMIC CHIP	2.2uF		16V
C980	1-164-337-11	CERAMIC CHIP	2.2uF		16V
C981	1-164-337-11	CERAMIC CHIP	2.2uF		16V
C982	1-127-558-11	ELECT(SOLID)	10uF	20%	10V
C983	1-164-337-11	CERAMIC CHIP	2.2uF		16V
C984	1-164-337-11	CERAMIC CHIP	2.2uF		16V
C985	1-128-004-11	ELECT CHIP	10uF	20%	16V
C986	1-127-558-11	ELECT(SOLID)	10uF	20%	10V
C987	1-128-004-11	ELECT CHIP	10uF	20%	16V
C988	1-127-559-11	ELECT(SOLID)	15uF	20%	6.3V
C989	1-127-559-11	ELECT(SOLID)	15uF	20%	6.3V
C992	1-128-004-11	ELECT CHIP	10uF	20%	16V
C993	1-126-205-11	ELECT CHIP	47uF	20%	6.3V
C994	1-162-970-11	CERAMIC CHIP	0.01uF	10%	25V
C995	1-128-530-11	ELECT CHIP	33uF	20%	10V

Ref. No.	Part No.	Description	Remarks
C996	1-128-004-11	ELECT CHIP 10uF	20% 16V
C998	1-128-530-11	ELECT CHIP 33uF	20% 10V
C999	1-164-346-11	CERAMIC CHIP 1uF	16V
		< CONNECTOR >	
CN950	1-691-542-21	CONNECTOR, BOARD TO BOARD 48P	
		< DIODE >	
D950	8-719-989-33	DIODE FC806	
D953	8-719-110-03	DIODE RD7.5ES	
D954	8-719-110-03	DIODE RD7.5ES	
D961	8-719-404-46	DIODE MA110	
D962	8-719-110-03	DIODE RD7.5ES	
D963	8-719-110-03	DIODE RD7.5ES	
D964	8-719-404-46	DIODE MA110	
		< FUSE >	
⚠F950	1-532-778-21	FUSE, MICRO 1.6A 125V	
⚠F951	1-532-778-21	FUSE, MICRO 1.6A 125V	
		< IC >	
IC950	8-759-060-94	IC MB3785APFV-G-BND-ER	
		< JACK >	
J950	1-537-281-31	TERMINAL BOARD	
J951	1-565-276-21	JACK, ULTRA SMALL 1P (REMOTE)	
J952	1-569-809-11	JACK (SMALL TYPE) (HEADPHONE)	
		< COIL >	
L954	1-424-522-21	COIL, CHOKE 10uH	
L955	1-424-522-21	COIL, CHOKE 10uH	
L956	1-424-522-21	COIL, CHOKE 10uH	
L957	1-424-524-21	COIL, CHOKE 47uH	
L958	1-412-034-11	INDUCTOR CHIP 330uH	
L959	1-412-034-11	INDUCTOR CHIP 330uH	
L960	1-412-027-11	INDUCTOR CHIP 2.2uH	
L961	1-412-029-11	INDUCTOR CHIP 10uH	
L962	1-412-029-11	INDUCTOR CHIP 10uH	
L963	1-412-028-11	INDUCTOR CHIP 4.7uH	
L964	1-424-524-21	COIL, CHOKE 47uH	
L965	1-424-524-21	COIL, CHOKE 47uH	
L966	1-410-369-11	INDUCTOR CHIP 1uH	
L967	1-410-369-11	INDUCTOR CHIP 1uH	
L972	1-412-991-11	INDUCTOR 10uH	
L974	1-412-991-11	INDUCTOR 10uH	
L975	1-412-991-11	INDUCTOR 10uH	
		< TRANSISTOR >	
Q950	8-729-823-95	TRANSISTOR FC149	
Q951	8-729-804-41	TRANSISTOR 2SB1122-S	

Ref. No.	Part No.	Description	Remarks
Q952	8-729-823-84	TRANSISTOR FP102	
Q953	8-729-823-82	TRANSISTOR FP101	
Q954	8-729-823-82	TRANSISTOR FP101	
Q955	8-729-403-35	TRANSISTOR UN5113	
Q957	8-729-011-26	TRANSISTOR 2SJ179	
Q958	8-729-420-12	TRANSISTOR XN4213	
Q959	8-729-019-91	TRANSISTOR 2SJ238-TE12L	
Q960	8-729-402-81	TRANSISTOR XN4501	
		< RESISTOR >	
R950	1-216-837-11	METAL CHIP 22K 5% 1/16W	
R951	1-218-720-11	METAL CHIP 15K 0.50% 1/16W	
R952	1-216-842-11	METAL CHIP 56K 5% 1/16W	
R953	1-216-837-11	METAL CHIP 22K 5% 1/16W	
R954	1-216-831-11	METAL CHIP 6.8K 5% 1/16W	
R955	1-216-827-11	METAL CHIP 3.3K 5% 1/16W	
R956	1-218-347-11	METAL GLAZE 91K 5% 1/16W	
R957	1-218-332-11	METAL GLAZE 130K 5% 1/16W	
R958	1-216-823-11	METAL CHIP 1.5K 5% 1/16W	
R959	1-218-720-11	METAL CHIP 15K 0.50% 1/16W	
R960	1-218-296-11	METAL CHIP 75K 0.50% 1/16W	
R961	1-216-834-11	METAL CHIP 12K 5% 1/16W	
R962	1-216-829-11	METAL CHIP 4.7K 5% 1/16W	
R964	1-218-720-11	METAL CHIP 15K 0.50% 1/16W	
R965	1-216-833-11	METAL CHIP 10K 5% 1/16W	
R966	1-218-706-11	METAL CHIP 3.9K 0.50% 1/16W	
R967	1-216-841-11	METAL CHIP 47K 5% 1/16W	
R968	1-216-832-11	METAL CHIP 8.2K 5% 1/16W	
R969	1-216-823-11	METAL CHIP 1.5K 5% 1/16W	
R970	1-216-830-11	METAL CHIP 5.6K 5% 1/16W	
R971	1-218-330-11	METAL CHIP 11K 0.50% 1/16W	
R972	1-216-845-11	METAL CHIP 100K 5% 1/16W	
R973	1-216-829-11	METAL CHIP 4.7K 5% 1/16W	
R974	1-216-829-11	METAL CHIP 4.7K 5% 1/16W	
R975	1-216-192-00	METAL CHIP 560 5% 1/8W	
R976	1-216-182-00	METAL GLAZE 220 5% 1/8W	
R977	1-216-182-00	METAL GLAZE 220 5% 1/8W	
R978	1-216-182-00	METAL GLAZE 220 5% 1/8W	
R980	1-216-827-11	METAL CHIP 3.3K 5% 1/16W	
R981	1-216-841-11	METAL CHIP 47K 5% 1/16W	
R982	1-216-845-11	METAL CHIP 100K 5% 1/16W	
R983	1-216-821-11	METAL CHIP 1K 5% 1/16W	
R984	1-216-836-11	METAL CHIP 18K 5% 1/16W	
R985	1-218-883-11	METAL CHIP 33K 0.50% 1/16W	
R986	1-216-845-11	METAL CHIP 100K 5% 1/16W	
R987	1-216-833-11	METAL CHIP 10K 5% 1/16W	
R988	1-216-864-11	METAL CHIP 0 5% 1/16W	
R989	1-216-820-11	METAL CHIP 820 5% 1/16W	
R994	1-216-295-00	METAL CHIP 0 5% 1/10W	
R995	1-216-295-00	METAL CHIP 0 5% 1/10W	

Note: The components identified by mark ⚠ or dotted line with mark ⚠ are critical for safety.
Replace only with part number specified.

Ref. No.	Part No.	Description			Remarks

< TRANSFORMER >

T950	1-450-874-21	TRANSFORMER, DC-DC CONVERTER			

< VIBRATOR >

X950	1-579-467-11	VIBRATOR, CERAMIC			

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A-7063-549-A SL-31 BOARD, COMPLETE
****

(Ref. No. 3,000 Series)

< CAPACITOR >

C500	1-135-259-11	TANTAL. CHIP	10uF	20%	6.3V
C503	1-164-346-11	CERAMIC CHIP	1uF		16V
C504	1-135-259-11	TANTAL. CHIP	10uF	20%	6.3V
C505	1-163-809-11	CERAMIC CHIP	0.047uF	10%	25V
C506	1-162-968-11	CERAMIC CHIP	0.0047uF	10%	50V
C507	1-164-156-11	CERAMIC CHIP	0.1uF		25V

< CONNECTOR >

CN501	1-691-473-21	CONNECTOR, FFC/FPC 7P			
CN502	1-691-472-21	CONNECTOR, FFC/FPC 6P			
CN503	1-691-482-21	CONNECTOR, FFC/FPC 15P			

< DIODE >

D511	8-719-404-46	DIODE MA110			

< IC >

IC501	8-759-059-09	IC LB8111V			

< COIL >

L501	1-412-026-11	INDUCTOR CHIP 1uH			

< TRANSISTOR >

Q501	8-729-402-81	TRANSISTOR XN4501			

< RESISTOR >

R501	1-216-840-11	METAL CHIP	39K	5%	1/16W
R504	1-216-864-11	METAL CHIP	0	5%	1/16W
R506	1-216-845-11	METAL CHIP	100K	5%	1/16W
R512	1-216-845-11	METAL CHIP	100K	5%	1/16W
R514	1-216-845-11	METAL CHIP	100K	5%	1/16W
R517	1-216-174-00	METAL GLAZE	100	5%	1/8W

< CONPOSITION CIRCUIT BLOCK >

RB500	1-236-424-11	NETWORK, RES 10K			
RB502	1-236-424-11	NETWORK, RES 10K			

Ref. No.	Part No.	Description			Remarks

< FLAT CABLE >

W500	1-644-461-31	FP-600 MOUNT BOARD			
W501	1-642-186-11	FP-437 FLEXIBLE BOARD			

****

A-7071-805-A SW-221 BOARD, COMPLETE
****

(Ref. No. 6,000 Series)

< CONNECTOR >

CN580	1-691-483-21	CONNECTOR, FFC/FPC 4P			

< SWITCH >

S580	1-692-111-11	SWITCH, KEY BOARD (START/STOP)			
S581	1-571-275-41	SWITCH, SLIDE (STANDBY/LOCK)			

****

A-7063-548-A VA-83 BOARD, COMPLETE
****

(Ref. No. 2,000 Series)

< CAPACITOR >

C052	1-162-638-11	CERAMIC CHIP	1uF		16V
C053	1-135-180-21	TANTALUM CHIP	3.3uF	20%	6.3V
C054	1-162-974-11	CERAMIC CHIP	0.01uF		50V
C055	1-162-974-11	CERAMIC CHIP	0.01uF		50V
C056	1-135-180-21	TANTALUM CHIP	3.3uF	20%	6.3V
C057	1-162-974-11	CERAMIC CHIP	0.01uF		50V
C058	1-135-180-21	TANTALUM CHIP	3.3uF	20%	6.3V
C059	1-164-156-11	CERAMIC CHIP	0.1uF		25V
C060	1-135-259-11	TANTAL. CHIP	10uF	20%	6.3V
C061	1-162-974-11	CERAMIC CHIP	0.01uF		50V
C062	1-162-974-11	CERAMIC CHIP	0.01uF		50V
C064	1-162-949-11	CERAMIC CHIP	47PF	5%	50V
C066	1-162-949-11	CERAMIC CHIP	47PF	5%	50V
C070	1-162-947-11	CERAMIC CHIP	33PF	5%	50V
C071	1-128-003-11	ELECT CHIP	22uF	20%	4V
C072	1-162-974-11	CERAMIC CHIP	0.01uF		50V
C073	1-162-974-11	CERAMIC CHIP	0.01uF		50V
C074	1-128-004-11	ELECT CHIP	10uF	20%	16V
C075	1-162-974-11	CERAMIC CHIP	0.01uF		50V
C077	1-128-004-11	ELECT CHIP	10uF	20%	16V
C092	1-162-974-11	CERAMIC CHIP	0.01uF		50V
C093	1-164-337-11	CERAMIC CHIP	2.2uF		16V
C095	1-162-974-11	CERAMIC CHIP	0.01uF		50V
C096	1-162-974-11	CERAMIC CHIP	0.01uF		50V
C099	1-164-156-11	CERAMIC CHIP	0.1uF		25V

Ref. No.	Part No.	Description			Remarks
C101	1-128-004-11	ELECT CHIP	10uF	20%	16V
C102	1-162-974-11	CERAMIC CHIP	0.01uF		50V
C103	1-162-974-11	CERAMIC CHIP	0.01uF		50V
C104	1-164-145-11	CERAMIC CHIP	390PF	5%	50V
C105	1-162-974-11	CERAMIC CHIP	0.01uF		50V
C106	1-162-947-11	CERAMIC CHIP	33PF	5%	50V
C107	1-162-965-11	CERAMIC CHIP	0.0015uF	10%	50V
C108	1-162-958-11	CERAMIC CHIP	270PF	5%	50V
C109	1-162-945-11	CERAMIC CHIP	22PF	5%	50V
C112	1-164-227-11	CERAMIC CHIP	0.022uF	10%	25V
C113	1-164-227-11	CERAMIC CHIP	0.022uF	10%	25V
C114	1-162-942-11	CERAMIC CHIP	12PF	5%	50V
C115	1-162-970-11	CERAMIC CHIP	0.01uF	10%	25V
C117	1-164-227-11	CERAMIC CHIP	0.022uF	10%	25V
C118	1-162-945-11	CERAMIC CHIP	22PF	5%	50V
C119	1-162-947-11	CERAMIC CHIP	33PF	5%	50V
C120	1-162-974-11	CERAMIC CHIP	0.01uF		50V
C121	1-164-227-11	CERAMIC CHIP	0.022uF	10%	25V
C122	1-162-917-11	CERAMIC CHIP	15PF	5%	50V
C123	1-162-922-11	CERAMIC CHIP	39PF	5%	50V
C124	1-164-218-11	CERAMIC CHIP	180PF	0.25PF	50V
C125	1-162-926-11	CERAMIC CHIP	82PF	5%	50V
C126	1-162-923-11	CERAMIC CHIP	47PF	5%	50V
C128	1-164-156-11	CERAMIC CHIP	0.1uF		25V
C201	1-162-959-11	CERAMIC CHIP	330PF	5%	50V
C202	1-162-957-11	CERAMIC CHIP	220PF	5%	50V
C203	1-164-005-11	CERAMIC CHIP	0.47uF		25V
C204	1-128-004-11	ELECT CHIP	10uF	20%	16V
C205	1-128-004-11	ELECT CHIP	10uF	20%	16V
C206	1-162-974-11	CERAMIC CHIP	0.01uF		50V
C207	1-162-974-11	CERAMIC CHIP	0.01uF		50V
C208	1-128-004-11	ELECT CHIP	10uF	20%	16V
C209	1-128-008-11	ELECT CHIP	3.3uF	20%	35V
C210	1-162-974-11	CERAMIC CHIP	0.01uF		50V
C211	1-128-004-11	ELECT CHIP	10uF	20%	16V
C212	1-128-008-11	ELECT CHIP	3.3uF	20%	35V
C213	1-128-004-11	ELECT CHIP	10uF	20%	16V
C214	1-128-004-11	ELECT CHIP	10uF	20%	16V
C215	1-128-004-11	ELECT CHIP	10uF	20%	16V
C217	1-164-005-11	CERAMIC CHIP	0.47uF		25V
C218	1-128-004-11	ELECT CHIP	10uF	20%	16V
C219	1-164-005-11	CERAMIC CHIP	0.47uF		25V
C221	1-128-004-11	ELECT CHIP	10uF	20%	16V
C222	1-162-974-11	CERAMIC CHIP	0.01uF		50V
C224	1-164-222-11	CERAMIC CHIP	0.22uF		25V
C225	1-164-005-11	CERAMIC CHIP	0.47uF		25V
C226	1-128-004-11	ELECT CHIP	10uF	20%	16V
C227	1-128-004-11	ELECT CHIP	10uF	20%	16V
C228	1-128-006-11	ELECT CHIP	4.7uF	20%	25V
C229	1-162-974-11	CERAMIC CHIP	0.01uF		50V

Ref. No.	Part No.	Description			Remarks
C230	1-126-246-11	ELECT CHIP	220uF	20%	4V
C231	1-128-004-11	ELECT CHIP	10uF	20%	16V
C232	1-162-967-11	CERAMIC CHIP	0.0033uF	10%	50V
C234	1-162-974-11	CERAMIC CHIP	0.01uF		50V
C235	1-128-004-11	ELECT CHIP	10uF	20%	16V
C238	1-126-607-11	ELECT CHIP	47uF	20%	4V
C239	1-162-960-11	CERAMIC CHIP	220PF	10%	50V
C240	1-128-004-11	ELECT CHIP	10uF	20%	16V
C241	1-162-974-11	CERAMIC CHIP	0.01uF		50V
C242	1-128-004-11	ELECT CHIP	10uF	20%	16V
C243	1-162-974-11	CERAMIC CHIP	0.01uF		50V
C244	1-128-004-11	ELECT CHIP	10uF	20%	16V
C245	1-162-974-11	CERAMIC CHIP	0.01uF		50V
C246	1-162-959-11	CERAMIC CHIP	330PF	5%	50V
C247	1-164-392-11	CERAMIC CHIP	390PF	5%	50V
C250	1-162-974-11	CERAMIC CHIP	0.01uF		50V
C251	1-128-004-11	ELECT CHIP	10uF	20%	16V
C252	1-162-948-11	CERAMIC CHIP	39PF	5%	50V
C253	1-162-949-11	CERAMIC CHIP	47PF	5%	50V
C258	1-162-955-11	CERAMIC CHIP	150PF	5%	50V
C260	1-128-004-11	ELECT CHIP	10uF	20%	16V
C261	1-128-004-11	ELECT CHIP	10uF	20%	16V
C271	1-162-948-11	CERAMIC CHIP	39PF	5%	50V
C273	1-162-949-11	CERAMIC CHIP	47PF	5%	50V
C274	1-162-946-11	CERAMIC CHIP	27PF	5%	50V
C275	1-162-950-11	CERAMIC CHIP	56PF	5%	50V
C276	1-162-953-11	CERAMIC CHIP	100PF	5%	50V
C280	1-128-004-11	ELECT CHIP	10uF	20%	16V
C291	1-162-974-11	CERAMIC CHIP	0.01uF		50V
C295	1-128-004-11	ELECT CHIP	10uF	20%	16V
C296	1-162-974-11	CERAMIC CHIP	0.01uF		50V
C303	1-128-004-11	ELECT CHIP	10uF	20%	16V
C304	1-162-974-11	CERAMIC CHIP	0.01uF		50V
C305	1-126-205-11	ELECT CHIP	47uF	20%	6.3V
C306	1-162-926-11	CERAMIC CHIP	82PF	5%	50V
C307	1-162-970-11	CERAMIC CHIP	0.01uF	10%	25V
C308	1-162-959-11	CERAMIC CHIP	330PF	5%	50V
C309	1-128-013-11	ELECT CHIP	1uF	20%	50V
C310	1-128-013-11	ELECT CHIP	1uF	20%	50V
C311	1-135-176-21	TANTALUM CHIP	0.68uF	10%	20V
C312	1-164-227-11	CERAMIC CHIP	0.022uF	10%	25V
C313	1-163-035-00	CERAMIC CHIP	0.047uF		50V
C314	1-135-259-11	TANTAL. CHIP	10uF	20%	6.3V
C315	1-162-945-11	CERAMIC CHIP	22PF	5%	50V
C316	1-162-950-11	CERAMIC CHIP	56PF	5%	50V
C318	1-162-974-11	CERAMIC CHIP	0.01uF		50V
C319	1-162-937-11	CERAMIC CHIP	6PF	0.5PF	50V
C320	1-162-947-11	CERAMIC CHIP	33PF	5%	50V
C321	1-162-974-11	CERAMIC CHIP	0.01uF		50V
C322	1-162-974-11	CERAMIC CHIP	0.01uF		50V

Ref. No.	Part No.	Description			Remarks
C323	1-162-945-11	CERAMIC CHIP	22PF	5%	50V
C324	1-162-974-11	CERAMIC CHIP	0.01uF		50V
C325	1-162-954-11	CERAMIC CHIP	120PF	5%	50V
C326	1-162-951-11	CERAMIC CHIP	68PF	5%	50V
C327	1-162-950-11	CERAMIC CHIP	56PF	5%	50V
C328	1-162-957-11	CERAMIC CHIP	220PF	5%	50V
C329	1-162-974-11	CERAMIC CHIP	0.01uF		50V
C330	1-162-949-11	CERAMIC CHIP	47PF	5%	50V
C331	1-164-156-11	CERAMIC CHIP	0.1uF		25V
C332	1-162-952-11	CERAMIC CHIP	82PF	5%	50V
C333	1-162-968-11	CERAMIC CHIP	0.0047uF	10%	50V
C334	1-162-953-11	CERAMIC CHIP	100PF	5%	50V
C335	1-162-974-11	CERAMIC CHIP	0.01uF		50V
C336	1-164-217-11	CERAMIC CHIP	150PF	5%	50V
C337	1-164-227-11	CERAMIC CHIP	0.022uF	10%	25V
C338	1-162-974-11	CERAMIC CHIP	0.01uF		50V
C339	1-164-156-11	CERAMIC CHIP	0.1uF		25V
C400	1-126-207-11	ELECT CHIP	33uF	20%	4V
C401	1-124-778-00	ELECT CHIP	22uF	20%	6.3V
C402	1-162-957-11	CERAMIC CHIP	220PF	5%	50V
C403	1-162-957-11	CERAMIC CHIP	220PF	5%	50V
C404	1-126-205-11	ELECT CHIP	47uF	20%	6.3V
C405	1-164-633-11	CERAMIC CHIP	0.1uF	10%	25V
C406	1-164-633-11	CERAMIC CHIP	0.1uF	10%	25V
C407	1-162-974-11	CERAMIC CHIP	0.01uF		50V
C408	1-164-156-11	CERAMIC CHIP	0.1uF		25V
C409	1-164-677-11	CERAMIC CHIP	0.033uF	10%	16V
C410	1-162-974-11	CERAMIC CHIP	0.01uF		50V
C412	1-162-957-11	CERAMIC CHIP	220PF	5%	50V
C413	1-164-156-11	CERAMIC CHIP	0.1uF		25V
C414	1-164-677-11	CERAMIC CHIP	0.033uF	10%	16V
C415	1-162-974-11	CERAMIC CHIP	0.01uF		50V
C416	1-162-974-11	CERAMIC CHIP	0.01uF		50V
C417	1-162-957-11	CERAMIC CHIP	220PF	5%	50V
C418	1-162-974-11	CERAMIC CHIP	0.01uF		50V
C419	1-162-974-11	CERAMIC CHIP	0.01uF		50V
C420	1-163-809-11	CERAMIC CHIP	0.047uF	10%	25V
C421	1-135-163-21	TANTAL. CHIP	47uF	20%	4V
C422	1-135-157-21	TANTALUM CHIP	10uF	20%	6.3V
C423	1-162-968-11	CERAMIC CHIP	0.0047uF	10%	50V
C425	1-135-181-21	TANTALUM CHIP	4.7uF	20%	6.3V
C426	1-162-974-11	CERAMIC CHIP	0.01uF		50V
C427	1-163-809-11	CERAMIC CHIP	0.047uF	10%	25V
C428	1-126-607-11	ELECT CHIP	47uF	20%	4V
C429	1-135-157-21	TANTALUM CHIP	10uF	20%	6.3V
C430	1-135-181-21	TANTALUM CHIP	4.7uF	20%	6.3V
C431	1-164-634-11	CERAMIC CHIP	1uF		16V
C432	1-164-634-11	CERAMIC CHIP	1uF		16V
C433	1-162-974-11	CERAMIC CHIP	0.01uF		50V
C434	1-162-967-11	CERAMIC CHIP	0.0033uF	10%	50V

Ref. No.	Part No.	Description			Remarks
C435	1-162-967-11	CERAMIC CHIP	0.0033uF	10%	50V
C436	1-162-974-11	CERAMIC CHIP	0.01uF		50V
C437	1-162-968-11	CERAMIC CHIP	0.0047uF	10%	50V
C439	1-162-949-11	CERAMIC CHIP	47PF	5%	50V
C440	1-162-949-11	CERAMIC CHIP	47PF	5%	50V
C441	1-162-957-11	CERAMIC CHIP	220PF	5%	50V
C442	1-162-957-11	CERAMIC CHIP	220PF	5%	50V
C443	1-135-181-21	TANTALUM CHIP	4.7uF	20%	6.3V
C444	1-135-181-21	TANTALUM CHIP	4.7uF	20%	6.3V
C445	1-135-091-00	TANTALUM CHIP	1uF	20%	16V
C446	1-135-091-00	TANTALUM CHIP	1uF	20%	16V
C447	1-135-157-21	TANTALUM CHIP	10uF	20%	6.3V
C448	1-135-157-21	TANTALUM CHIP	10uF	20%	6.3V
C449	1-162-969-11	CERAMIC CHIP	0.0068uF	10%	25V
C450	1-162-969-11	CERAMIC CHIP	0.0068uF	10%	25V
C451	1-162-977-11	CERAMIC CHIP	0.0018uF	10%	50V
C453	1-162-977-11	CERAMIC CHIP	0.0018uF	10%	50V
C454	1-126-205-11	ELECT CHIP	47uF	20%	6.3V
C455	1-164-634-11	CERAMIC CHIP	1uF		16V
C456	1-164-634-11	CERAMIC CHIP	1uF		16V
C457	1-135-163-21	TANTAL. CHIP	47uF	20%	4V
C458	1-162-966-11	CERAMIC CHIP	0.0022uF	10%	50V
C459	1-162-966-11	CERAMIC CHIP	0.0022uF	10%	50V
C460	1-162-952-11	CERAMIC CHIP	82PF	5%	50V
C461	1-126-607-11	ELECT CHIP	47uF	20%	4V
C462	1-162-970-11	CERAMIC CHIP	0.01uF	10%	25V
C463	1-162-970-11	CERAMIC CHIP	0.01uF	10%	25V
C464	1-162-970-11	CERAMIC CHIP	0.01uF	10%	25V
C465	1-164-634-11	CERAMIC CHIP	1uF		16V
C466	1-162-970-11	CERAMIC CHIP	0.01uF	10%	25V
C467	1-135-201-11	TANTALUM CHIP	10uF	20%	4V
C468	1-135-201-11	TANTALUM CHIP	10uF	20%	4V
C469	1-135-157-21	TANTALUM CHIP	10uF	20%	6.3V
C470	1-164-634-11	CERAMIC CHIP	1uF		16V
C471	1-135-201-11	TANTALUM CHIP	10uF	20%	4V
C472	1-135-201-11	TANTALUM CHIP	10uF	20%	4V
C473	1-162-970-11	CERAMIC CHIP	0.01uF	10%	25V
C475	1-164-634-11	CERAMIC CHIP	1uF		16V
C476	1-164-634-11	CERAMIC CHIP	1uF		16V
C477	1-164-634-11	CERAMIC CHIP	1uF		16V
C478	1-164-634-11	CERAMIC CHIP	1uF		16V
C479	1-164-156-11	CERAMIC CHIP	0.1uF		25V
C480	1-135-201-11	TANTALUM CHIP	10uF	20%	4V
C481	1-135-201-11	TANTALUM CHIP	10uF	20%	4V
C482	1-162-974-11	CERAMIC CHIP	0.01uF		50V
C483	1-162-974-11	CERAMIC CHIP	0.01uF		50V
C484	1-162-974-11	CERAMIC CHIP	0.01uF		50V
C485	1-164-156-11	CERAMIC CHIP	0.1uF		25V
C486	1-164-005-11	CERAMIC CHIP	0.47uF		25V
C487	1-162-970-11	CERAMIC CHIP	0.01uF	10%	25V

Ref. No.	Part No.	Description			Remarks
C488	1-135-181-21	TANTALUM CHIP	4.7uF	20%	6.3V
C490	1-135-181-21	TANTALUM CHIP	4.7uF	20%	6.3V
C491	1-162-970-11	CERAMIC CHIP	0.01uF	10%	25V
C492	1-162-970-11	CERAMIC CHIP	0.01uF	10%	25V
C493	1-164-156-11	CERAMIC CHIP	0.1uF		25V
C494	1-135-181-21	TANTALUM CHIP	4.7uF	20%	6.3V
C497	1-164-634-11	CERAMIC CHIP	1uF		16V
C498	1-164-634-11	CERAMIC CHIP	1uF		16V
C651	1-162-969-11	CERAMIC CHIP	0.0068uF	10%	25V
C652	1-162-970-11	CERAMIC CHIP	0.01uF	10%	25V
C655	1-164-634-11	CERAMIC CHIP	1uF		16V
C990	1-126-205-11	ELECT CHIP	47uF	20%	6.3V
C991	1-162-974-11	CERAMIC CHIP	0.01uF		50V

< FILTER >

CF301	1-579-370-11	FILTER, CERAMIC 4.32MHz

< CONNECTOR >

CN201	1-691-479-21	CONNECTOR, BOARD TO BOARD 40P
CN202	1-691-477-21	CONNECTOR, BOARD TO BOARD 28P
CN400	1-691-490-21	CONNECTOR, FFC/FPC 11P

< DIODE >

D102	8-719-800-76	DIODE	1SS226
D201	8-719-404-35	DIODE	MA141WK
D202	8-719-404-35	DIODE	MA141WK
D203	8-719-027-48	DIODE	MA142WA
D205	8-719-404-35	DIODE	MA141WK
D206	8-719-404-35	DIODE	MA141WK

< FILTER >

FL051	1-236-757-21	FILTER, LOW PASS (C)
FL053	1-236-834-21	FILTER, LOW PASS
FL054	1-415-751-21	DELAY LINE, LC (YH)
FL301	1-236-575-11	B.P.F (PAL-M)
FL302	1-236-146-11	FILTER, BAND PASS
FL400	1-236-837-21	FILTER, BAND PASS
FL401	1-236-838-21	FILTER, BAND PASS

< IC >

IC051	8-752-332-68	IC	CXL5502M
IC052	8-759-710-29	IC	NJM2235M
IC053	8-759-031-84	IC	SC7S04F
IC054	8-752-053-21	IC	CXA1211M
IC201	8-752-065-54	IC	CXA1207AR-T6
IC202	8-759-710-29	IC	NJM2235M
IC203	8-759-067-52	IC	MB88347PFV-G-BND-ER
IC204	8-759-635-27	IC	M62352GP
IC205	8-759-636-33	IC	CXA1452N
IC206	8-752-053-21	IC	CXA1211M

Ref. No.	Part No.	Description	Remarks
IC301	8-752-051-40	IC CXA1208R-T4	
IC400	8-759-823-19	IC CXA1488RR	
IC401	8-759-823-19	IC CXA1488RR	
IC402	8-759-823-21	IC CXA1536QQ	

< COIL >

L101	1-412-029-11	INDUCTOR CHIP 10uH
L102	1-412-792-41	INDUCTOR 22uH
L103	1-412-280-31	INDUCTOR 330uH
L104	1-410-167-41	INDUCTOR CHIP 820uH
L105	1-410-657-21	INDUCTOR CHIP 180uH
L109	1-410-657-21	INDUCTOR CHIP 180uH
L110	1-410-387-11	INDUCTOR CHIP 33uH
L113	1-412-788-41	INDUCTOR 10uH
L114	1-410-380-31	INDUCTOR CHIP 8.2uH
L115	1-412-280-31	INDUCTOR 330uH
L116	1-410-655-31	INDUCTOR CHIP 120uH
L202	1-412-031-11	INDUCTOR CHIP 47uH
L203	1-412-029-11	INDUCTOR CHIP 10uH
L204	1-412-796-41	INDUCTOR 47uH
L206	1-410-390-11	INDUCTOR CHIP 56uH
L208	1-412-796-41	INDUCTOR 47uH
L213	1-412-792-41	INDUCTOR 22uH
L214	1-412-796-41	INDUCTOR 47uH
L215	1-410-390-11	INDUCTOR CHIP 56uH
L216	1-410-390-11	INDUCTOR CHIP 56uH
L301	1-412-792-41	INDUCTOR 22uH
L302	1-412-792-41	INDUCTOR 22uH
L303	1-410-393-11	INDUCTOR CHIP 100uH
L304	1-410-379-21	INDUCTOR CHIP 6.8uH
L305	1-410-393-11	INDUCTOR CHIP 100uH
L306	1-410-655-31	INDUCTOR CHIP 120uH
L307	1-410-656-11	INDUCTOR CHIP 150uH
L308	1-410-393-11	INDUCTOR CHIP 100uH
L402	1-412-031-11	INDUCTOR CHIP 47uH

< TRANSISTOR >

Q051	8-729-420-12	TRANSISTOR	XN4213
Q052	8-729-141-48	TRANSISTOR	2SB624-BV345
Q053	8-729-230-60	TRANSISTOR	2SA1586-YG
Q055	8-729-230-63	TRANSISTOR	2SC4116-YG
Q057	8-729-230-63	TRANSISTOR	2SC4116-YG
Q060	8-729-230-63	TRANSISTOR	2SC4116-YG
Q063	8-729-422-54	TRANSISTOR	XN4215
Q064	8-729-230-63	TRANSISTOR	2SC4116-YG
Q065	8-729-230-63	TRANSISTOR	2SC4116-YG
Q066	8-729-230-60	TRANSISTOR	2SA1586-YG
Q067	8-729-420-53	TRANSISTOR	UN5115
Q103	8-729-230-63	TRANSISTOR	2SC4116-YG
Q104	8-729-230-63	TRANSISTOR	2SC4116-YG
Q110	8-729-014-16	TRANSISTOR	RN2302-TE85L
Q111	8-729-102-07	TRANSISTOR	2SC2223-F13

Ref. No.	Part No.	Description	Remarks
Q114	8-729-230-63	TRANSISTOR 2SC4116-YG	
Q115	8-729-403-35	TRANSISTOR UN5113	
Q118	8-729-420-12	TRANSISTOR XN4213	
Q119	8-729-230-60	TRANSISTOR 2SA1586-YG	
Q120	8-729-102-07	TRANSISTOR 2SC2223-F13	
Q122	8-729-230-63	TRANSISTOR 2SC4116-YG	
Q202	8-729-230-60	TRANSISTOR 2SA1586-YG	
Q204	8-729-230-63	TRANSISTOR 2SC4116-YG	
Q213	8-729-402-42	TRANSISTOR UN5213	
Q214	8-729-101-07	TRANSISTOR 2SB798-DL	
Q216	8-729-230-63	TRANSISTOR 2SC4116-YG	
Q217	8-729-230-63	TRANSISTOR 2SC4116-YG	
Q218	8-729-230-60	TRANSISTOR 2SA1586-YG	
Q221	8-729-230-63	TRANSISTOR 2SC4116-YG	
Q224	8-729-402-42	TRANSISTOR UN5213	
Q225	8-729-402-42	TRANSISTOR UN5213	
Q226	8-729-823-16	TRANSISTOR 2SC4555-5.6.7	
Q227	8-729-420-12	TRANSISTOR XN4213	
Q228	8-729-230-63	TRANSISTOR 2SC4116-YG	
Q229	8-729-230-63	TRANSISTOR 2SC4116-YG	
Q230	8-729-230-60	TRANSISTOR 2SA1586-YG	
Q231	8-729-115-28	TRANSISTOR BN1L3Z-K	
Q235	8-729-230-60	TRANSISTOR 2SA1586-YG	
Q302	8-729-402-81	TRANSISTOR XN4501	
Q306	8-729-230-63	TRANSISTOR 2SC4116-YG	
Q307	8-729-230-63	TRANSISTOR 2SC4116-YG	
Q308	8-729-230-60	TRANSISTOR 2SA1586-YG	
Q309	8-729-230-63	TRANSISTOR 2SC4116-YG	
Q312	8-729-420-20	TRANSISTOR XN4312	
Q313	8-729-403-35	TRANSISTOR UN5113	
Q314	8-729-230-63	TRANSISTOR 2SC4116-YG	
Q318	8-729-402-42	TRANSISTOR UN5213	
Q400	8-729-230-60	TRANSISTOR 2SA1586-YG	
Q401	8-729-402-81	TRANSISTOR XN4501	
Q402	8-729-402-81	TRANSISTOR XN4501	
Q403	8-729-230-63	TRANSISTOR 2SC4116-YG	
Q404	8-729-014-12	TRANSISTOR RN1311-TE85L	
Q405	8-729-014-12	TRANSISTOR RN1311-TE85L	
Q406	8-729-014-12	TRANSISTOR RN1311-TE85L	
Q407	8-729-402-42	TRANSISTOR UN5213	
Q408	8-729-402-42	TRANSISTOR UN5213	
Q409	8-729-402-81	TRANSISTOR XN4501	
Q411	8-729-402-42	TRANSISTOR UN5213	
Q413	8-729-014-12	TRANSISTOR RN1311-TE85L	
Q414	8-729-403-27	TRANSISTOR XN4401	
Q415	8-729-420-20	TRANSISTOR XN4312	
Q416	8-729-402-81	TRANSISTOR XN4501	
Q417	8-729-821-88	TRANSISTOR 2SK1332-3	
Q990	8-729-101-07	TRANSISTOR 2SB798-DL	
Q991	8-729-230-63	TRANSISTOR 2SC4116-YG	

Ref. No.	Part No.	Description	Remarks
		< RESISTOR >	
R051	1-216-833-11	METAL CHIP 10K 5% 1/16W	
R052	1-216-841-11	METAL CHIP 47K 5% 1/16W	
R053	1-216-827-11	METAL CHIP 3.3K 5% 1/16W	
R054	1-216-857-11	METAL CHIP 1M 5% 1/16W	
R055	1-216-821-11	METAL CHIP 1K 5% 1/16W	
R056	1-216-844-11	METAL CHIP 82K 5% 1/16W	
R059	1-216-864-11	METAL CHIP 0 5% 1/16W	
R060	1-216-864-11	METAL CHIP 0 5% 1/16W	
R061	1-216-864-11	METAL CHIP 0 5% 1/16W	
R062	1-216-839-11	METAL CHIP 33K 5% 1/16W	
R063	1-216-842-11	METAL CHIP 56K 5% 1/16W	
R064	1-216-817-11	METAL CHIP 470 5% 1/16W	
R065	1-216-821-11	METAL CHIP 1K 5% 1/16W	
R068	1-216-821-11	METAL CHIP 1K 5% 1/16W	
R072	1-216-825-11	METAL CHIP 2.2K 5% 1/16W	
R073	1-216-825-11	METAL CHIP 2.2K 5% 1/16W	
R074	1-216-821-11	METAL CHIP 1K 5% 1/16W	
R075	1-216-821-11	METAL CHIP 1K 5% 1/16W	
R079	1-216-825-11	METAL CHIP 2.2K 5% 1/16W	
R081	1-216-821-11	METAL CHIP 1K 5% 1/16W	
R082	1-216-825-11	METAL CHIP 2.2K 5% 1/16W	
R083	1-216-821-11	METAL CHIP 1K 5% 1/16W	
R085	1-216-827-11	METAL CHIP 3.3K 5% 1/16W	
R087	1-216-864-11	METAL CHIP 0 5% 1/16W	
R088	1-216-847-11	METAL CHIP 150K 5% 1/16W	
R089	1-216-839-11	METAL CHIP 33K 5% 1/16W	
R090	1-216-838-11	METAL CHIP 27K 5% 1/16W	
R091	1-216-829-11	METAL CHIP 4.7K 5% 1/16W	
R092	1-216-837-11	METAL CHIP 22K 5% 1/16W	
R093	1-216-839-11	METAL CHIP 33K 5% 1/16W	
R094	1-216-864-11	METAL CHIP 0 5% 1/16W	
R105	1-216-821-11	METAL CHIP 1K 5% 1/16W	
R106	1-216-821-11	METAL CHIP 1K 5% 1/16W	
R107	1-216-811-11	METAL CHIP 150 5% 1/16W	
R108	1-216-831-11	METAL CHIP 6.8K 5% 1/16W	
R109	1-216-835-11	METAL CHIP 15K 5% 1/16W	
R110	1-216-821-11	METAL CHIP 1K 5% 1/16W	
R111	1-216-812-11	METAL CHIP 180 5% 1/16W	
R114	1-216-818-11	METAL CHIP 560 5% 1/16W	
R125	1-216-823-11	METAL CHIP 1.5K 5% 1/16W	
R126	1-216-820-11	METAL CHIP 820 5% 1/16W	
R127	1-216-834-11	METAL CHIP 12K 5% 1/16W	
R128	1-216-833-11	METAL CHIP 10K 5% 1/16W	
R129	1-216-817-11	METAL CHIP 470 5% 1/16W	
R130	1-216-823-11	METAL CHIP 1.5K 5% 1/16W	
R131	1-216-824-11	METAL CHIP 1.8K 5% 1/16W	
R132	1-216-808-11	METAL CHIP 82 5% 1/16W	
R133	1-216-864-11	METAL CHIP 0 5% 1/16W	
R137	1-216-821-11	METAL CHIP 1K 5% 1/16W	
R140	1-216-836-11	METAL CHIP 18K 5% 1/16W	

Ref. No.	Part No.	Description			Remarks
R141	1-216-836-11	METAL CHIP	18K	5%	1/16W
R142	1-216-821-11	METAL CHIP	1K	5%	1/16W
R143	1-216-864-11	METAL CHIP	0	5%	1/16W
R144	1-216-821-11	METAL CHIP	1K	5%	1/16W
R147	1-216-827-11	METAL CHIP	3.3K	5%	1/16W
R148	1-216-818-11	METAL CHIP	560	5%	1/16W
R149	1-216-809-11	METAL CHIP	100	5%	1/16W
R150	1-216-817-11	METAL CHIP	470	5%	1/16W
R151	1-216-817-11	METAL CHIP	470	5%	1/16W
R152	1-216-837-11	METAL CHIP	22K	5%	1/16W
R153	1-216-818-11	METAL CHIP	560	5%	1/16W
R154	1-216-818-11	METAL CHIP	560	5%	1/16W
R155	1-216-821-11	METAL CHIP	1K	5%	1/16W
R157	1-216-864-11	METAL CHIP	0	5%	1/16W
R158	1-216-817-11	METAL CHIP	470	5%	1/16W
R159	1-216-815-11	METAL CHIP	330	5%	1/16W
R201	1-216-820-11	METAL CHIP	820	5%	1/16W
R202	1-216-820-11	METAL CHIP	820	5%	1/16W
R203	1-216-837-11	METAL CHIP	22K	5%	1/16W
R204	1-216-864-11	METAL CHIP	0	5%	1/16W
R205	1-216-864-11	METAL CHIP	0	5%	1/16W
R207	1-216-824-11	METAL CHIP	1.8K	5%	1/16W
R208	1-216-804-11	METAL CHIP	39	5%	1/16W
R209	1-216-804-11	METAL CHIP	39	5%	1/16W
R210	1-216-864-11	METAL CHIP	0	5%	1/16W
R211	1-216-820-11	METAL CHIP	820	5%	1/16W
R212	1-216-821-11	METAL CHIP	1K	5%	1/16W
R213	1-216-804-11	METAL CHIP	39	5%	1/16W
R214	1-216-804-11	METAL CHIP	39	5%	1/16W
R215	1-216-807-11	METAL CHIP	68	5%	1/16W
R216	1-218-740-11	METAL CHIP	100K	0.50%	1/16W
R217	1-216-853-11	METAL CHIP	470K	5%	1/16W
R220	1-216-818-11	METAL CHIP	560	5%	1/16W
R222	1-216-821-11	METAL CHIP	1K	5%	1/16W
R223	1-216-821-11	METAL CHIP	1K	5%	1/16W
R224	1-216-833-11	METAL CHIP	10K	5%	1/16W
R225	1-216-829-11	METAL CHIP	4.7K	5%	1/16W
R230	1-216-829-11	METAL CHIP	4.7K	5%	1/16W
R231	1-216-826-11	METAL CHIP	2.7K	5%	1/16W
R232	1-216-822-11	METAL CHIP	1.2K	5%	1/16W
R236	1-216-827-11	METAL CHIP	3.3K	5%	1/16W
R239	1-216-817-11	METAL CHIP	470	5%	1/16W
R240	1-216-864-11	METAL CHIP	0	5%	1/16W
R246	1-216-833-11	METAL CHIP	10K	5%	1/16W
R247	1-216-833-11	METAL CHIP	10K	5%	1/16W
R248	1-216-833-11	METAL CHIP	10K	5%	1/16W
R249	1-216-813-11	METAL CHIP	220	5%	1/16W
R250	1-216-841-11	METAL CHIP	47K	5%	1/16W
R251	1-216-822-11	METAL CHIP	1.2K	5%	1/16W
R252	1-216-828-11	METAL CHIP	3.9K	5%	1/16W
R253	1-216-821-11	METAL CHIP	1K	5%	1/16W
R254	1-216-864-11	METAL CHIP	0	5%	1/16W
R255	1-216-864-11	METAL CHIP	0	5%	1/16W
R256	1-216-295-00	METAL CHIP	0	5%	1/10W
R264	1-216-820-11	METAL CHIP	820	5%	1/16W
R265	1-216-821-11	METAL CHIP	1K	5%	1/16W
R266	1-216-829-11	METAL CHIP	4.7K	5%	1/16W
R267	1-216-809-11	METAL CHIP	100	5%	1/16W
R268	1-216-821-11	METAL CHIP	1K	5%	1/16W
R269	1-216-833-11	METAL CHIP	10K	5%	1/16W
R270	1-216-824-11	METAL CHIP	1.8K	5%	1/16W
R271	1-216-823-11	METAL CHIP	1.5K	5%	1/16W
R272	1-216-825-11	METAL CHIP	2.2K	5%	1/16W
R273	1-216-817-11	METAL CHIP	470	5%	1/16W
R275	1-216-837-11	METAL CHIP	22K	5%	1/16W
R276	1-216-817-11	METAL CHIP	470	5%	1/16W
R277	1-216-811-11	METAL CHIP	150	5%	1/16W
R279	1-216-810-11	METAL CHIP	120	5%	1/16W
R280	1-216-811-11	METAL CHIP	150	5%	1/16W
R281	1-216-825-11	METAL CHIP	2.2K	5%	1/16W
R282	1-216-820-11	METAL CHIP	820	5%	1/16W
R283	1-216-820-11	METAL CHIP	820	5%	1/16W
R284	1-216-822-11	METAL CHIP	1.2K	5%	1/16W
R285	1-216-813-11	METAL CHIP	220	5%	1/16W
R286	1-216-818-11	METAL CHIP	560	5%	1/16W
R287	1-216-817-11	METAL CHIP	470	5%	1/16W
R288	1-216-820-11	METAL CHIP	820	5%	1/16W
R289	1-216-828-11	METAL CHIP	3.9K	5%	1/16W
R290	1-216-864-11	METAL CHIP	0	5%	1/16W
R296	1-216-833-11	METAL CHIP	10K	5%	1/16W
R298	1-216-864-11	METAL CHIP	0	5%	1/16W
R299	1-216-825-11	METAL CHIP	2.2K	5%	1/16W
R301	1-218-740-11	METAL CHIP	100K	0.50%	1/16W
R305	1-216-831-11	METAL CHIP	6.8K	5%	1/16W
R306	1-216-830-11	METAL CHIP	5.6K	5%	1/16W
R307	1-216-831-11	METAL CHIP	6.8K	5%	1/16W
R308	1-216-832-11	METAL CHIP	8.2K	5%	1/16W
R309	1-216-828-11	METAL CHIP	3.9K	5%	1/16W
R310	1-216-825-11	METAL CHIP	2.2K	5%	1/16W
R311	1-216-817-11	METAL CHIP	470	5%	1/16W
R312	1-216-827-11	METAL CHIP	3.3K	5%	1/16W
R313	1-216-825-11	METAL CHIP	2.2K	5%	1/16W
R318	1-216-837-11	METAL CHIP	22K	5%	1/16W
R319	1-216-831-11	METAL CHIP	6.8K	5%	1/16W
R320	1-216-817-11	METAL CHIP	470	5%	1/16W
R321	1-216-822-11	METAL CHIP	1.2K	5%	1/16W
R322	1-216-825-11	METAL CHIP	2.2K	5%	1/16W
R323	1-216-822-11	METAL CHIP	1.2K	5%	1/16W
R324	1-216-821-11	METAL CHIP	1K	5%	1/16W
R326	1-216-821-11	METAL CHIP	1K	5%	1/16W

Ref. No.	Part No.	Description	Remarks
R327	1-216-823-11	METAL CHIP 1.5K 5% 1/16W	
R328	1-216-827-11	METAL CHIP 3.3K 5% 1/16W	
R329	1-216-822-11	METAL CHIP 1.2K 5% 1/16W	
R330	1-216-822-11	METAL CHIP 1.2K 5% 1/16W	
R331	1-216-825-11	METAL CHIP 2.2K 5% 1/16W	
R332	1-216-818-11	METAL CHIP 560 5% 1/16W	
R333	1-216-829-11	METAL CHIP 4.7K 5% 1/16W	
R335	1-216-864-11	METAL CHIP 0 5% 1/16W	
R336	1-216-864-11	METAL CHIP 0 5% 1/16W	
R339	1-216-864-11	METAL CHIP 0 5% 1/16W	
R340	1-216-825-11	METAL CHIP 2.2K 5% 1/16W	
R344	1-216-824-11	METAL CHIP 1.8K 5% 1/16W	
R345	1-216-819-11	METAL CHIP 680 5% 1/16W	
R347	1-216-833-11	METAL CHIP 10K 5% 1/16W	
R348	1-216-840-11	METAL CHIP 39K 5% 1/16W	
R401	1-216-837-11	METAL CHIP 22K 5% 1/16W	
R403	1-216-837-11	METAL CHIP 22K 5% 1/16W	
R404	1-216-859-11	METAL GLAZE 1.5M 5% 1/16W	
R405	1-216-851-11	METAL CHIP 330K 5% 1/16W	
R406	1-216-859-11	METAL GLAZE 1.5M 5% 1/16W	
R408	1-216-833-11	METAL CHIP 10K 5% 1/16W	
R409	1-216-839-11	METAL CHIP 33K 5% 1/16W	
R410	1-216-839-11	METAL CHIP 33K 5% 1/16W	
R411	1-216-834-11	METAL CHIP 12K 5% 1/16W	
R412	1-216-834-11	METAL CHIP 12K 5% 1/16W	
R415	1-216-832-11	METAL CHIP 8.2K 5% 1/16W	
R416	1-216-821-11	METAL CHIP 1K 5% 1/16W	
R417	1-216-839-11	METAL CHIP 33K 5% 1/16W	
R418	1-216-821-11	METAL CHIP 1K 5% 1/16W	
R420	1-216-839-11	METAL CHIP 33K 5% 1/16W	
R421	1-216-839-11	METAL CHIP 33K 5% 1/16W	
R423	1-216-833-11	METAL CHIP 10K 5% 1/16W	
R424	1-216-833-11	METAL CHIP 10K 5% 1/16W	
R425	1-216-810-11	METAL CHIP 120 5% 1/16W	
R426	1-216-823-11	METAL CHIP 1.5K 5% 1/16W	
R427	1-216-815-11	METAL CHIP 330 5% 1/16W	
R428	1-216-825-11	METAL CHIP 2.2K 5% 1/16W	
R430	1-216-823-11	METAL CHIP 1.5K 5% 1/16W	
R431	1-216-827-11	METAL CHIP 3.3K 5% 1/16W	
R432	1-216-827-11	METAL CHIP 3.3K 5% 1/16W	
R433	1-216-825-11	METAL CHIP 2.2K 5% 1/16W	
R434	1-216-827-11	METAL CHIP 3.3K 5% 1/16W	
R435	1-216-825-11	METAL CHIP 2.2K 5% 1/16W	
R436	1-216-825-11	METAL CHIP 2.2K 5% 1/16W	
R437	1-216-836-11	METAL CHIP 18K 5% 1/16W	
R438	1-216-837-11	METAL CHIP 22K 5% 1/16W	
R439	1-216-836-11	METAL CHIP 18K 5% 1/16W	
R440	1-216-837-11	METAL CHIP 22K 5% 1/16W	
R441	1-216-821-11	METAL CHIP 1K 5% 1/16W	
R442	1-216-821-11	METAL CHIP 1K 5% 1/16W	

Ref. No.	Part No.	Description	Remarks
R443	1-216-821-11	METAL CHIP 1K 5% 1/16W	
R444	1-216-821-11	METAL CHIP 1K 5% 1/16W	
R445	1-216-818-11	METAL CHIP 560 5% 1/16W	
R446	1-216-849-11	METAL CHIP 220K 5% 1/16W	
R447	1-216-819-11	METAL CHIP 680 5% 1/16W	
R448	1-216-810-11	METAL CHIP 120 5% 1/16W	
R449	1-216-823-11	METAL CHIP 1.5K 5% 1/16W	
R450	1-216-841-11	METAL CHIP 47K 5% 1/16W	
R451	1-216-813-11	METAL CHIP 220 5% 1/16W	
R452	1-216-819-11	METAL CHIP 680 5% 1/16W	
R453	1-216-819-11	METAL CHIP 680 5% 1/16W	
R454	1-216-841-11	METAL CHIP 47K 5% 1/16W	
R455	1-216-813-11	METAL CHIP 220 5% 1/16W	
R456	1-216-813-11	METAL CHIP 220 5% 1/16W	
R457	1-218-716-11	METAL CHIP 10K 0.50% 1/16W	
R458	1-218-714-11	METAL CHIP 8.2K 0.50% 1/16W	
R459	1-218-706-11	METAL CHIP 3.9K 0.50% 1/16W	
R460	1-216-813-11	METAL CHIP 220 5% 1/16W	
R461	1-216-813-11	METAL CHIP 220 5% 1/16W	
R464	1-216-827-11	METAL CHIP 3.3K 5% 1/16W	
R465	1-216-827-11	METAL CHIP 3.3K 5% 1/16W	
R466	1-216-818-11	METAL CHIP 560 5% 1/16W	
R467	1-216-827-11	METAL CHIP 3.3K 5% 1/16W	
R468	1-216-849-11	METAL CHIP 220K 5% 1/16W	
R469	1-216-802-11	METAL CHIP 27 0.50% 1/16W	
R470	1-216-810-11	METAL CHIP 120 5% 1/16W	
R471	1-216-851-11	METAL CHIP 330K 5% 1/16W	
R472	1-216-851-11	METAL CHIP 330K 5% 1/16W	
R476	1-216-832-11	METAL CHIP 8.2K 5% 1/16W	
R478	1-216-849-11	METAL CHIP 220K 5% 1/16W	
R483	1-216-864-11	METAL CHIP 0 5% 1/16W	
R484	1-216-864-11	METAL CHIP 0 5% 1/16W	
R486	1-216-849-11	METAL CHIP 220K 5% 1/16W	
R487	1-216-849-11	METAL CHIP 220K 5% 1/16W	
R488	1-216-864-11	METAL CHIP 0 5% 1/16W	
R490	1-216-864-11	METAL CHIP 0 5% 1/16W	
R494	1-216-864-11	METAL CHIP 0 5% 1/16W	
R495	1-216-849-11	METAL CHIP 220K 5% 1/16W	
R497	1-216-851-11	METAL CHIP 330K 5% 1/16W	
R498	1-216-849-11	METAL CHIP 220K 5% 1/16W	
R651	1-216-295-00	METAL CHIP 0 5% 1/10W	
R652	1-216-845-11	METAL CHIP 100K 5% 1/16W	
R653	1-216-864-11	METAL CHIP 0 5% 1/16W	
R654	1-216-864-11	METAL CHIP 0 5% 1/16W	
R655	1-216-864-11	METAL CHIP 0 5% 1/16W	
R657	1-216-821-11	METAL CHIP 1K 5% 1/16W	
R658	1-216-864-11	METAL CHIP 0 5% 1/16W	
R659	1-216-841-11	METAL CHIP 47K 5% 1/16W	
R660	1-216-833-11	METAL CHIP 10K 5% 1/16W	
R661	1-216-843-11	METAL CHIP 68K 5% 1/16W	

Ref. No.	Part No.	Description			Remarks
R662	1-216-833-11	METAL CHIP	10K	5%	1/16W
R663	1-216-829-11	METAL CHIP	4.7K	5%	1/16W
R664	1-216-829-11	METAL CHIP	4.7K	5%	1/16W
R665	1-216-841-11	METAL CHIP	47K	5%	1/16W
R950	1-216-825-11	METAL CHIP	2.2K	5%	1/16W
R953	1-216-813-11	METAL CHIP	220	5%	1/16W
R954	1-216-837-11	METAL CHIP	22K	5%	1/16W
R955	1-216-834-11	METAL CHIP	12K	5%	1/16W
R956	1-216-825-11	METAL CHIP	2.2K	5%	1/16W
R957	1-216-829-11	METAL CHIP	4.7K	5%	1/16W
R958	1-216-815-11	METAL CHIP	330	5%	1/16W
R960	1-216-817-11	METAL CHIP	470	5%	1/16W
R961	1-216-821-11	METAL CHIP	1K	5%	1/16W
R962	1-216-815-11	METAL CHIP	330	5%	1/16W
R963	1-216-840-11	METAL CHIP	39K	5%	1/16W
R964	1-216-836-11	METAL CHIP	18K	5%	1/16W
R965	1-216-821-11	METAL CHIP	1K	5%	1/16W
R990	1-216-830-11	METAL CHIP	5.6K	5%	1/16W
R991	1-216-138-00	METAL CHIP	3.3	5%	1/8W
R995	1-216-820-11	METAL CHIP	820	5%	1/16W
R996	1-216-836-11	METAL CHIP	18K	5%	1/16W

< CONPOSITION CIRCUIT BLOCK >

RB101	1-236-428-11	NETWORK, RES 22K
RB301	1-236-414-11	NETWORK, RES 1.5K

< VARIABLE RESISTOR >

RV051	1-238-087-11	RES, ADJ, CERMET	1K
RV051	1-238-853-11	RES, ADJ, CERMET 1K	

< VIBRATOR >

X301	1-577-080-11	VIBRATOR, CRYSTAL

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A-7063-019-A VF-44 BOARD, COMPLETE

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(Ref.No.2,000 Series)

< CAPACITOR >

C501	1-163-115-00	CERAMIC CHIP	82PF	5%	50V
C502	1-126-176-11	ELECT	220uF	20%	10V
C503	1-163-077-00	CERAMIC CHIP	0.1uF	10%	25V
C504	1-163-009-11	CERAMIC CHIP	0.001uF	10%	50V
⚠C505	1-163-053-00	CERAMIC CHIP	0.0033uF	10%	50V
⚠C506	1-163-058-00	CERAMIC CHIP	0.0082uF	10%	50V
C508	1-127-515-11	ELECT(SOLID)	47uF	20%	6.3V
C509	1-126-090-11	ELECT	82uF	20%	10V
C510	1-164-611-11	CERAMIC CHIP	0.001uF	10%	500V
C511	1-124-257-00	ELECT	2.2uF	20%	50V
C512	1-163-037-11	CERAMIC CHIP	0.022uF	10%	25V
C513	1-137-306-11	FILM CHIP	0.1uF	5%	16V
C514	1-162-638-11	CERAMIC CHIP	1uF		16V
C515	1-131-381-00	TANTALUM	47uF	10%	10V
C516	1-163-037-11	CERAMIC CHIP	0.022uF	10%	25V
C517	1-135-091-00	TANTALUM CHIP	1uF	20%	16V

< CONNECTOR >

* CN501	1-566-762-11	PIN, CONNECTOR (PC BOARD) 7P
* CN502	1-566-195-11	PIN, CONNECTOR (PC BOARD) 2P
* CN503	1-566-195-11	PIN, CONNECTOR (PC BOARD) 2P

< DIODE >

D501	8-719-024-87	DIODE	LN1261CAL
D502	8-719-024-87	DIODE	LN1261CAL
D503	8-719-400-20	DIODE	MA152WA

< IC >

IC501	8-759-420-01	IC	AN2512S

< COIL >

L501	1-412-031-11	INDUCTOR CHIP 47uH
L502	1-410-385-11	INDUCTOR CHIP 22uH
⚠L503	1-460-220-11	COIL, FERRITE (HLC)

< TRANSISTOR >

Q501	8-729-216-31	TRANSISTOR	2SA1163-G
Q502	8-729-120-28	TRANSISTOR	2SC1623-L5L6
Q503	8-729-106-68	TRANSISTOR	2SD1615A-GP

< RESISTOR >

R501	1-216-063-00	METAL CHIP	3.9K	5%	1/10W
R502	1-216-061-00	METAL CHIP	3.3K	5%	1/10W
R503	1-216-063-00	METAL CHIP	3.9K	5%	1/10W
R504	1-216-041-00	METAL CHIP	470	5%	1/10W
R505	1-216-041-00	METAL CHIP	470	5%	1/10W
R506	1-216-073-00	METAL CHIP	10K	5%	1/10W
R507	1-216-051-00	METAL CHIP	1.2K	5%	1/10W
R508	1-216-005-00	METAL CHIP	15	5%	1/10W
R509	1-216-870-11	METAL CHIP	180K	1%	1/10W
R510	1-216-079-00	METAL CHIP	18K	5%	1/10W
R511	1-216-133-00	METAL CHIP	3.3M	5%	1/10W
R512	1-216-133-00	METAL CHIP	3.3M	5%	1/10W
R513	1-216-125-00	METAL CHIP	1.5M	5%	1/10W
R514	1-216-121-00	METAL CHIP	1M	5%	1/10W
R515	1-216-055-00	METAL CHIP	1.8K	5%	1/10W
R516	1-216-025-00	METAL CHIP	100	5%	1/10W
R517	1-216-308-00	METAL CHIP	4.7	5%	1/10W
R518	1-216-336-11	METAL CHIP	47K	1%	1/10W
R519	1-216-099-00	METAL CHIP	120K	5%	1/10W
R520	1-216-121-00	METAL CHIP	1M	5%	1/10W

Note: The components identified by mark ⚠ or dotted line with mark ⚠ are critical for safety.
Replace only with part number specified.

Ref. No.	Part No.	Description			Remarks
R521	1-216-160-00	METAL GLAZE	27	5%	1/8W
R522	1-216-053-00	METAL CHIP	1.5K	5%	1/10W
R523	1-216-113-00	METAL CHIP	470K	5%	1/10W
R524	1-216-097-00	METAL CHIP	100K	5%	1/10W
R525	1-216-031-00	METAL CHIP	180	5%	1/10W
R526	1-216-748-11	METAL CHIP	39K	1%	1/10W

< VARIABLE RESISTOR >

RV501	1-238-088-11	RES, ADJ, CERMET	2.2K
RV501	1-238-854-11	RES, ADJ, CERMET	2.2K
RV502	1-241-497-11	RES, ADJ, METAL GLAZE	
RV503	1-238-096-11	RES, ADJ CERMET	1M
RV503	1-238-862-11	RES, ADJ, CERMET	1M
RV504	1-238-092-11	RES, ADJ, CERMET	47K
RV504	1-238-858-11	RES, ADJ, CERMET	47K
RV505	1-238-086-11	RES, ADJ, CERMET	470
RV505	1-238-852-11	RES, ADJ, CERMET	470

< SWITCH >

S501	1-692-032-21	SWITCH, TACTILE (HORIZONTAL) (EDIT SEARC
S502	1-692-032-21	SWITCH, TACTILE (HORIZONTAL) (EDIT SEARC

< TRANSFORMER >

⚠T501	1-439-525-11	TRANSFORMER ASSY, FLYBACK

< THERMISTOR >

TH501	1-809-350-21	THERMISTOR, NTC (2125)

< FLAT CABLE >

⚠W502	1-526-978-51	SOCKET ASSY, CRT

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A-7063-366-A VF-51 BOARD, COMPLETE

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(Ref. No. 11,000 Series)

< CAPACITOR >

C501	1-163-109-00	CERAMIC CHIP	47PF	5%	50V
C502	1-126-176-11	ELECT	220uF	20%	10V
C503	1-163-077-00	CERAMIC CHIP	0.1uF	10%	25V
C504	1-163-009-11	CERAMIC CHIP	0.001uF	10%	50V
⚠C505	1-164-713-11	CERAMIC CHIP	0.0056uF	5%	50V
⚠C507	1-162-625-11	CERAMIC CHIP	0.0047uF	5%	50V
C508	1-127-515-11	ELECT(SOLID)	47uF	20%	6.3V
C509	1-124-577-11	ELECT	82uF	20%	10V
C510	1-164-611-11	CERAMIC CHIP	0.001uF	10%	500V
C511	1-124-257-00	ELECT	2.2uF	20%	50V
C512	1-163-037-11	CERAMIC CHIP	0.022uF	10%	25V
C513	1-137-306-11	FILM CHIP	0.1uF	5%	16V
C514	1-164-337-11	CERAMIC CHIP	2.2uF		16V

Ref. No.	Part No.	Description			Remarks
C515	1-131-381-00	TANTALUM	47uF	10%	10V
C516	1-163-037-11	CERAMIC CHIP	0.022uF	10%	25V
C517	1-135-149-21	TANTALUM CHIP	2.2uF	20%	10V

< CONNECTOR >

* CN501	1-566-762-11	PIN, CONNECTOR (PC BOARD) 7P
* CN502	1-566-195-11	PIN, CONNECTOR (PC BOARD) 2P
* CN503	1-566-195-11	PIN, CONNECTOR (PC BOARD) 2P

< DIODE >

D501	8-719-024-87	DIODE	LN1261CAL
D502	8-719-024-87	DIODE	LN1261CAL
D503	8-719-400-20	DIODE	MA152WA

< IC >

IC501	8-759-420-01	IC	AN2512S

< COIL >

L501	1-412-031-11	INDUCTOR CHIP 47uH
L502	1-410-389-31	INDUCTOR CHIP 47uH
⚠L503	1-402-725-11	COIL, FERRITE (HLC)

< TRANSISTOR >

Q501	8-729-216-31	TRANSISTOR	2SA1163-G
Q502	8-729-120-28	TRANSISTOR	2SC1623-L5L6
Q503	8-729-106-68	TRANSISTOR	2SD1615A-GP
Q504	8-729-120-28	TRANSISTOR	2SC1623-L5L6

< RESISTOR >

R502	1-216-069-00	METAL CHIP	6.8K	5%	1/10W
R503	1-216-047-00	METAL CHIP	820	5%	1/10W
R504	1-216-041-00	METAL CHIP	470	5%	1/10W
R505	1-216-041-00	METAL CHIP	470	5%	1/10W
R506	1-216-324-11	METAL GLAZE	10K	1%	1/10W
R507	1-218-150-11	METAL GLAZE	1.2K	1%	1/10W
R508	1-216-003-11	METAL GLAZE	12	5%	1/10W
R509	1-216-101-00	METAL CHIP	150K	5%	1/10W
R511	1-216-131-11	METAL CHIP	2.7M	5%	1/10W
R512	1-216-131-11	METAL CHIP	2.7M	5%	1/10W
R513	1-216-121-00	METAL CHIP	1M	5%	1/10W
R514	1-216-121-00	METAL CHIP	1M	5%	1/10W
R515	1-216-055-00	METAL CHIP	1.8K	5%	1/10W
R516	1-216-025-00	METAL CHIP	100	5%	1/10W
R517	1-216-308-00	METAL CHIP	4.7	5%	1/10W
R518	1-216-336-11	METAL CHIP	47K	1%	1/10W
R519	1-216-099-00	METAL CHIP	120K	5%	1/10W
R520	1-216-121-00	METAL CHIP	1M	5%	1/10W
R521	1-216-160-00	METAL GLAZE	27	5%	1/8W
R522	1-216-053-00	METAL CHIP	1.5K	5%	1/10W
R523	1-216-113-00	METAL CHIP	470K	5%	1/10W

Note: The components identified by mark ⚠ or dotted line with mark ⚠ are critical for safety. Replace only with part number specified.

Ref. No.	Part No.	Description	Remarks
R524	1-216-097-00	METAL CHIP 100K 5%	1/10W
R525	1-216-033-00	METAL CHIP 220 5%	1/10W
R526	1-216-689-11	METAL CHIP 39K 0.5%	1/10W
R527	1-216-689-11	METAL CHIP 39K 0.5%	1/10W
		< VARIABLE RESISTOR >	
RV501	1-238-088-11	RES, ADJ, CERMET 2.2K	
RV501	1-238-854-11	RES, ADJ, CERMET 2.2K	
RV503	1-238-561-11	RES, ADJ, METAL GLAZE 1M	
RV504	1-238-092-11	RES, ADJ, CERMET 47K	
RV504	1-238-858-11	RES, ADJ, CERMET 47K	
RV505	1-238-086-11	RES, ADJ, CERMET 470	
RV505	1-238-852-11	RES, ADJ, CERMET 470	
		< SWITCH >	
S501	1-692-032-21	SWITCH, TACTILE(HORIZONTAL)	(EDIT SEARCH +)
S502	1-692-032-21	SWITCH, TACTILE(HORIZONTAL)	(EDIT SEARCH -)
		< TRANSFORMER >	
⚠T501	1-439-486-11	TRANSFORMER ASSY, FLYBACK	
		< THERMISTOR >	
TH501	1-809-350-21	THERMISTOR, NTC (2125)	
		< FLAT CABLE >	
⚠W502	1-540-019-51	SOCKET ASSY, CRT	

****

Ref. No.	Part No.	Description	Remarks
	A-7071-803-A	VK-30 BOARD, COMPLETE **********************	(Ref. No. 4,000 Series)
		< CONNECTOR >	
CN571	1-691-488-21	CONNECTOR, FFC/FPC 9P	
CN574	1-691-483-21	CONNECTOR, FFC/FPC 4P	
* CN575	1-580-055-21	PIN, CONNECTOR 2P	
		< DIODE >	
D570	8-719-820-05	DIODE 1SS181	
		< SWITCH >	
S570	1-572-498-11	SWITCH, SLIDE (EJECT)	
S571	1-572-921-31	SWITCH, KEY BOARD (REW)	
S572	1-572-921-31	SWITCH, KEY BOARD (FF)	
S573	1-572-921-31	SWITCH, KEY BOARD (PLAY)	
S574	1-572-921-31	SWITCH, KEY BOARD (STOP)	
S575	1-572-498-11	SWITCH, SLIDE (REC)	
S576	1-572-921-31	SWITCH, KEY BOARD (PAUSE)	

Ref. No.	Part No.	Description	Remarks
		< FLAT CABLE >	
W570	1-647-480-11	FP-6 FLEXIBLE BOARD	
W573	1-690-774-11	CABLE, FLAT (FFC-56) 11P	

****

MISCELLANEOUS
****

Ref. No.	Part No.	Description	Remarks
	1-452-565-11	CRT ASSY	
13	1-550-743-11	HOLDER, BATTERY	
25	1-542-162-11	MICROHONE UNIT	
32	1-690-604-11	CABLE, FLAT (FFC-33) 4P	
36	1-537-415-11	TERMINAL BOAD	
40	1-223-355-11	RES, VAR, CARBON (uF) 50K	
42	1-693-017-11	REMOTE COMMANDER (CAM CODER)	
⚠57	1-451-310-21	DEFLECTION YOKE (B/W)	
95	1-809-663-11	DISPLAY PANEL, LIQUID CRYSTAL	
105	1-692-257-21	SWITCH, PUSH (ZOOM)	
117	1-691-471-11	CONNECTOR, TRANSLATION 11P	
132	1-547-558-21	FILTER BLOCK, OPTICAL	
133	1-547-606-11	LENS, ZOOM (VCL-6012WA)	
IC901	A-7030-311-A	CCD BLOCK ASSY (AUTO)	
M901	A-7048-564-A	DRUM ASSY (DGH-78A-R)	
M902	8-835-477-01	MOTOR, DC SCE-0101A (CAPSTAN)	
M903	A-7040-304-A	MOTOR BLOCK ASSY, LM (LOADING)	
M904	3-708-644-01	IRIS ASSY	
M905	3-708-612-01	FOCUS MOTOR ASSY, STEPPING	
M906	3-708-642-01	ZOOM MOTOR ASSY	
⚠V901	1-546-091-11	CATHODE-RAY TUBE, B/W	

****

ACCESSORIES & PACKING MATERIALS
****

Ref. No.	Part No.	Description	Remarks
	1-575-334-11	CORD, CONNECTION	
	3-738-517-01	BELT (S), SHOULDER	
*	3-948-408-01	CUSHION (UPPER)	
	3-756-446-21	MANUAL, INSTRUCTION (ENGLISH)(FX620)	
	3-756-596-11	MANUAL, INSTRUCTION (ENGLISH/SPANISH) (FX600)	
	3-756-596-41	MANUAL, INSTRUCTION (CHINESE)(FX600)	
*	3-756-850-11	INSTRUCTION (FX620)	
*	3-795-581-21	SAFEGUARD (SONY), IMPORTANT (FX620)	
*	3-947-112-01	CUSHION (LOWER)	
*	3-950-282-21	INDIVIDUAL CARTON (FX620)	
*	3-950-282-51	INDIVIDUAL CARTON (FX600)	
	3-954-526-01	LABEL, CARTON RECYCLE (FX620)	

Note: The components identified by mark ⚠ or dotted line with mark ⚠ are critical for safety. Replace only with part number specified.

SECTION 7
CAMERA SECTION ADJUSTMENTS

When performing adjustments, refer to the layout diagrams for adjustment related parts beginning from page 216.

7-1. PREPARATIONS BEFORE ADJUSTMENT (CAMERA SECTION)

7-1-1. List of Service Tools

- Oscilloscope
- Adjusting driver
- Stabilized power supply
- Color monitor
- Vectorscope
- Digital voltmeter

Ref. No.	Name	Part Code	Usage
J-1	Filter for color temperature correction (C14)	J-6080-058-A	Auto white balance adjustment/check White balance adjustment/check
J-2	ND filter 1.0	J-6080-808-A	Max gain adjustment (2 used) White balance check
	ND filter 0.4	J-6080-806-A	Max gain adjustment
	ND filter 0.3	J-6080-818-A	White balance adjustment
	ND filter 0.1	J-6080-807-A	Max gain adjustment
J-3	Pattern box PTB-500	J-6029-140-A	
J-4	Color chart for pattern box	J-6020-250-A	
J-5	Adjusting remote control unit (RM-95-remodeled in part)Note 1	J-6082-053-A	
J-6	Siemens star	J-6080-875-A	FOCUS check
J-7	Measuring pin for camera section	J-6082-139-A	For the camera section adjustment
J-8	Extension cord (30P, 0.8 mm)	J-6082-167-A	For extension of CS-44 board (For the mecha deck check)
J-9	Extension cord (40P, 0.8 mm)	J-6082-168-A	For extension of VA-83 board (For the video section adjustment)
	Extension cord (28P, 0.8 mm)	J-6082-174-A	For extension of VA-83 board (For the video section adjustment)
	Extension cord (18P, 0.8 mm)	J-6082-170-A	For extension of CD-112 board (For the repair of the camera section)
J-10	Extension cord (21P, 0.5 mm)	J-6082-171-A (J-6082-138-A)	For extension of lens block (For the repair of the camera section)
J-11	Extension cord (15P, 0.8 mm)	J-6082-172-A	For extension of cabinet L (PJ-55, VK-30 boards) (For the video section adjustment)
	Extension cord (11P, 0.8mm)	J-6082-184-A	For extension of cabinet L (PJ-55, VK-30 boards) (For the video section adjustment)

Note: If the micro processor IC in the adjusting remote control unit is not the new micro processor (UPD7503G-C56-12), the switchover of the page cannot be carried out. In this case, replace with the new micro processor (8-759-148-35).

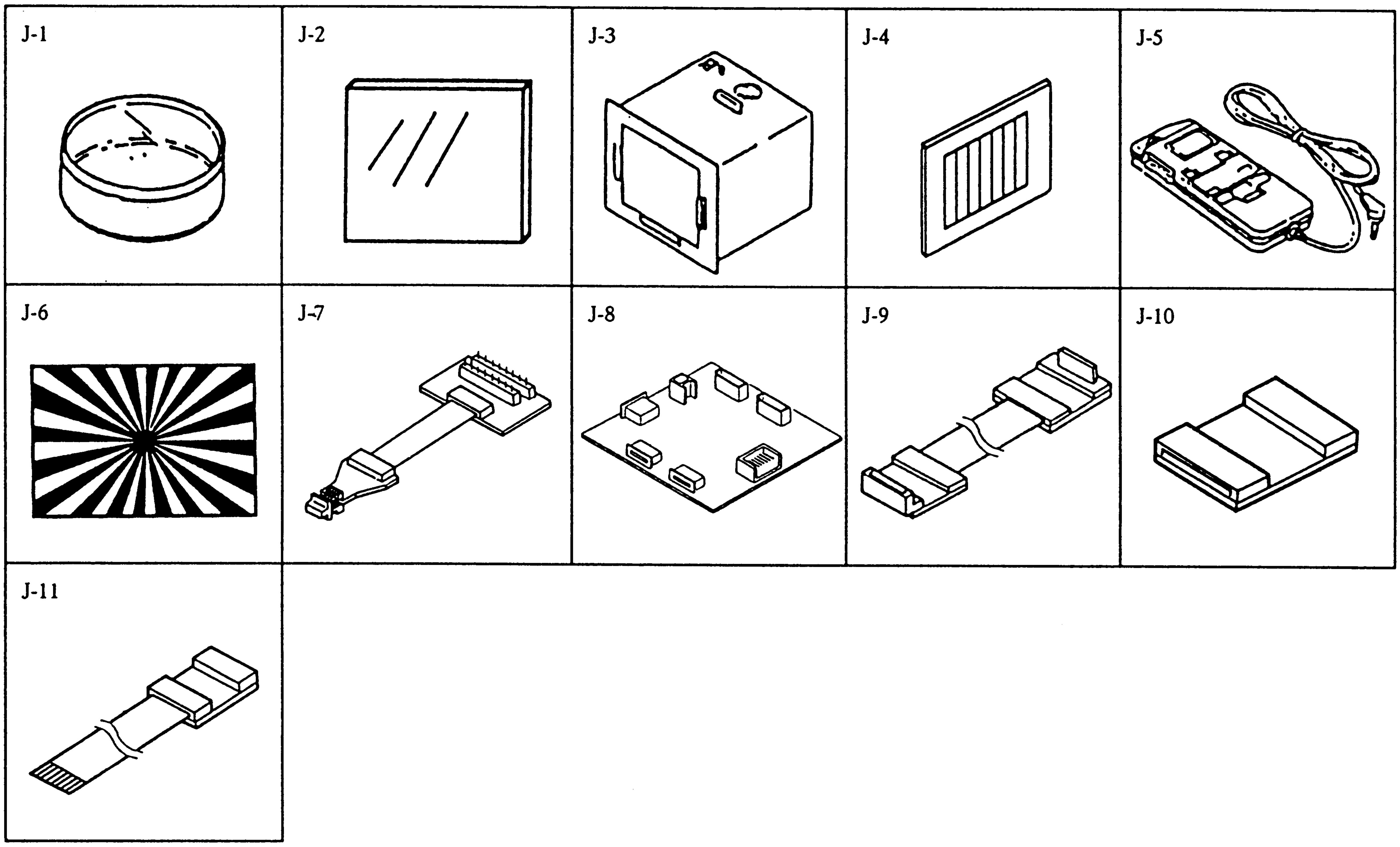

J-1
J-2
J-3
J-4
J-5
J-6
J-7
J-8
J-9
J-10
J-11

Fig. 7-1.

7-1-2. Preparations

Note: For further details on how to remove the cabinet and each board, refer to "1. Disassembly".

1) Connect the equipments for adjustment as shown in Fig. 7-3.

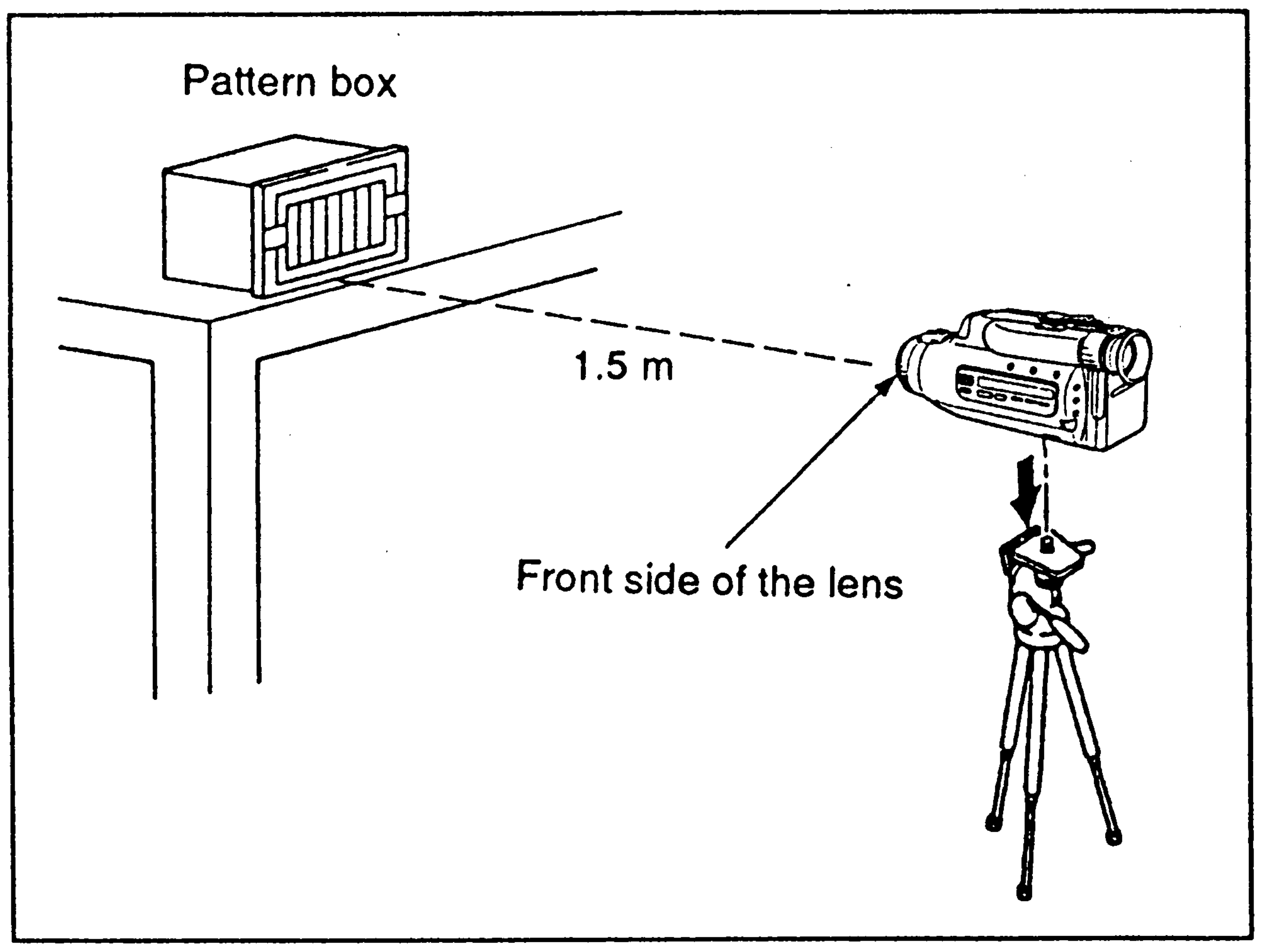

Pattern box
1.5 m
Front side of the lens

Fig. 7-2.

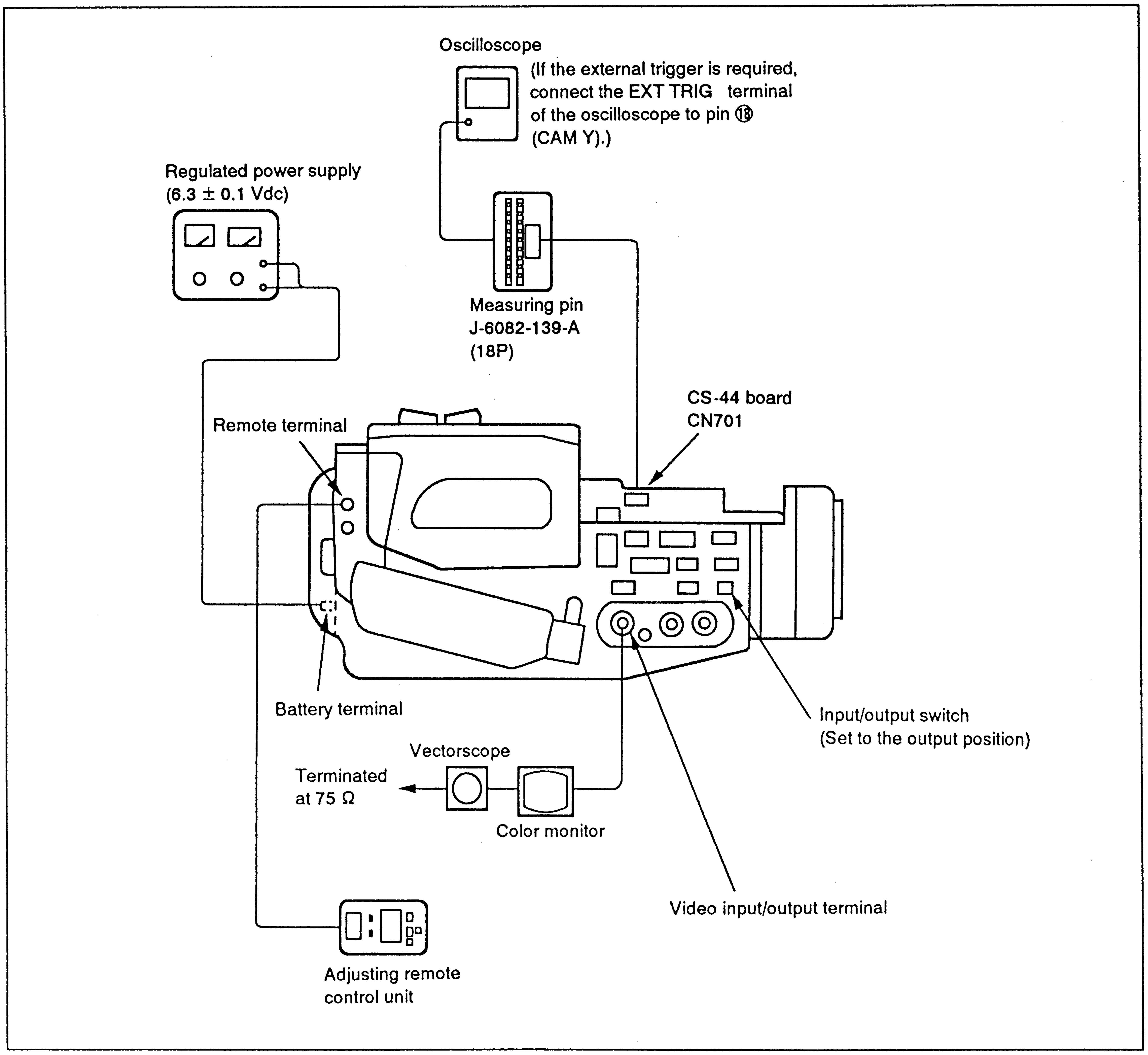

Oscilloscope
(If the external trigger is required, connect the EXT TRIG terminal of the oscilloscope to pin ⑱ (CAM Y).)
Regulated power supply
(6.3 ± 0.1 Vdc)
Measuring pin
J-6082-139-A
(18P)
CS-44 board
CN701
Remote terminal
Battery terminal
Input/output switch
(Set to the output position)
Vectorscope
Terminated at 75 Ω
Color monitor
Video input/output terminal
Adjusting remote control unit

Fig. 7-3.

7-1-3. Precautions

1. Switch settings

Adjust the switches to the following positions, and perform the adjustments without inserting the tape, unless specified otherwise.

1. Camera/video power switch (PK-37board S540)·····Camera
2. Standby switch (SW-221board S581)··················Standby
3. AUTO LOCK switch (CK-63board S568)················ OFF
4. Input/output switchover switch (PJ-55board S551) ···Output
5. Back light button (CK-63board S567)·······················Off
6. PROGRAM AE button (CK-63board S569)················Off

2. Adjustment Procedure

Perform in the given order as a rule.

3. Subject

1) Color bar chart (Standard picture frame)
   Adjust the display frame as shown in Fig. 7-4. if adjustments are performed using the color bar chart.
   (Standard picture frame)
2) White pattern (Standard picture frame)
   Remove the color bar chart from the pattern box, and adjust the zoom lever so that the white pattern becomes the same size and is in the same position as the color bar chart (Standard picture frame).

Color bar chart standard picture frame

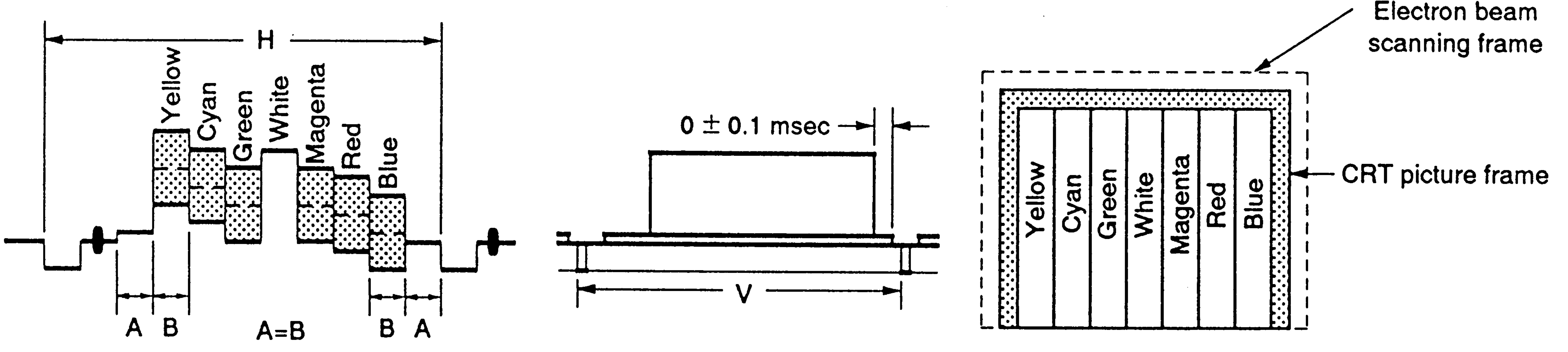

H
Yellow
Cyan
Green
White
Magenta
Red
Blue
A B
A=B
B A
0 ± 0.1 msec
V
Electron beam scanning frame
Yellow
Cyan
Green
White
Magenta
Red
Blue
CRT picture frame

Fig. a (Video input/output terminal output waveform)

Fig. b (Picture on monitor TV)

Adjust the zooming and direction of the camera to obtain the output waveform shown in Fig. a and the monitor TV picture shown in Fig. b.

Fig. 7-4.

3) Chart for flange back adjustment
   Combine a white A0 size (1189 mm× 841 mm) paper to a black one, and make the chart shown in Fig. 7-5.

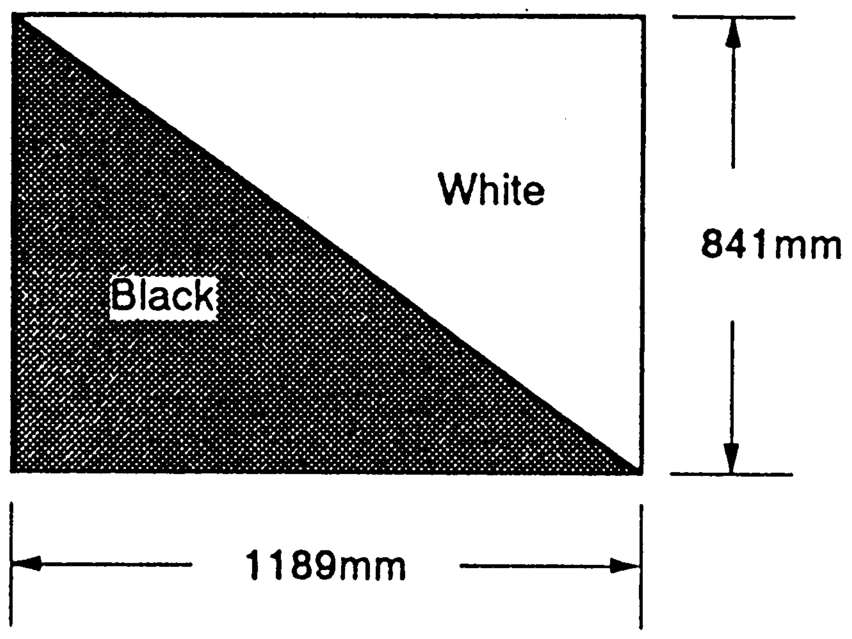

White
Black
841mm
1189mm

Fig. 7-5.

Note: Use the non-reflecting and non-glazing vellum paper whose size is more than A0, and make the boundary between white and black to be smoothly flat.

7-1-4. Adjusting Remote Control Unit

The camera section is adjusted by changing the constant using the coefficient of the digital signal processing calculation, or modifying the output voltage of EVR IC (CS-44 board IC702). These processes are carried out by the camera micro processor (CS-44 board IC709). This micro processor reads the data written in the non-volatile memory (CS-44 board IC712), and transmits it to the digital signal processing circuit and EVR.

The adjusting remote control unit is used for rewriting the adjustment data written in the non-volatile memory necessary for performing the adjustments.

The adjusting remote control unit uses the remote control signal line (LANC) to correspond mutually with the camera micro processor. The page, address and the up/down command of the data can be transmitted from the remote control unit to the camera micro processor. On the other hand, the page, address, and data can also be transmitted the other way round.

1. Using the Adjusting Remote Control Unit

1) Connect the adjusting remote control unit to the remote terminal (PS-312 board J951).
2) Adjust the HOLD switch of the adjusting remote control unit to HOLD (SERVICE position).
   If it has been properly connected, the LCD on the adjusting remote control unit will show the display in Fig. 7-6.

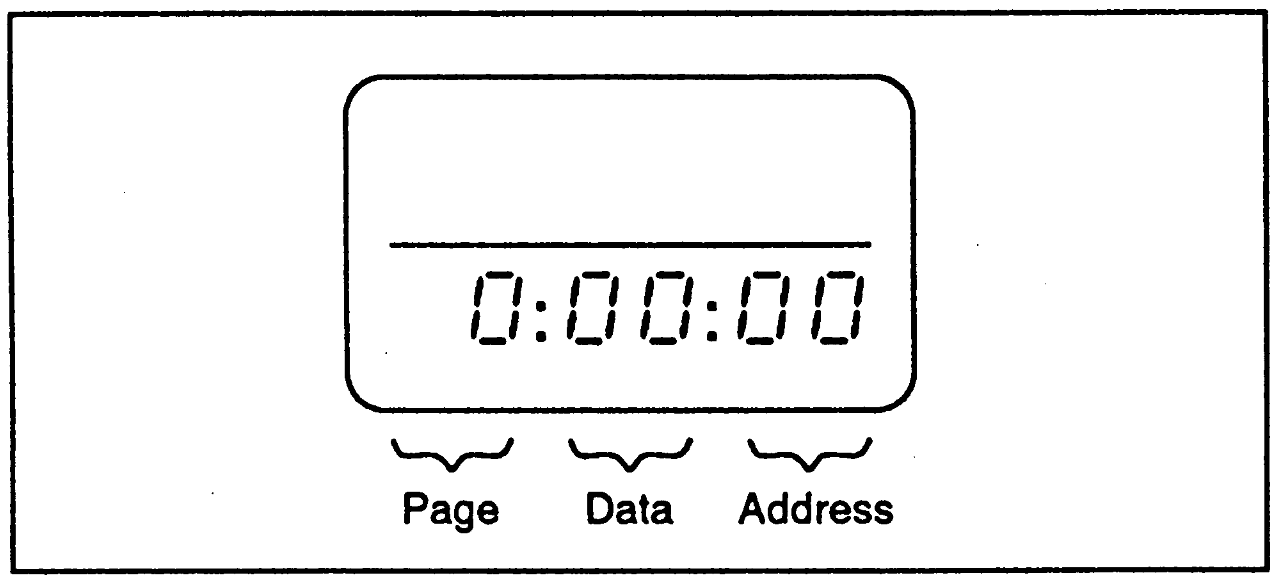


Fig. 7-6.

3) Operate the adjusting remote control unit as follows.
   - Changing the page
     The page will increase when the EDIT SEARCH+ button is pressed. It will decrease when the EDIT SEARCH– button is pressed. There are altogether 16 pages, from 0 to F.

Hexadecimal notation	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
Display on LCD	0	1	2	3	4	5	6	7	8	9	A	b	c	d	E	F
Decimal notation conversion value	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15

Table 7-1.

   - Changing the address
     The address will increase when the FF (▶▶) button is pressed, and decrease when the REW (◀◀) button is pressed. There are altogether 256 addresses, from 00 to FF.
   - Changing the data (Data setting)
     The data will increase when the PLAY (▶) button is pressed, and decrease when the STOP (■) button is pressed.
     There are altogether 256 data, from 00 to FF.
   - Writing the adjustment data
     It is necessary to press the PAUSE button to write the adjustment data (F page, D page) in the non-volatile memory.
     (The new adjustment data will not be recorded in the non-volatile memory if this operation is not performed.)
4) Select page: 6, address: 00, and adjust the data to 01. This releases the write protect of page F, and the camera section (F page) can be adjusted.
   (To adjust the titler system (D page), adjust the data of page: 1, address: 00 to 01, and release the protect of page D.)
5) After completing all adjustments, turn off the main power (6.3V) once. This can release the adjustment mode (other than page F).

2. Precations upon Using the Adjusting Remote Control Unit

The correct adjustment data may be erased at times, due to operation errors of the adjusting remote control unit. To prevent this from occurring, it is recommended that all adjustment data be recorded in the memory before beginning adjustments, and the new adjustment data be recorded in the memory after each adjustment.

7-1-5. Page F Address List

Note 1: The data listed in the adjustment data memo column are fixed values.

Note 2: The adjustment data initial values are the values after performing "Page F Data Initialization" and "Page F Data Modification". They are different from the value after performing all the adjustments.

<table>
<tr><th rowspan="2">Address</th><th rowspan="2">Name</th><th rowspan="2" colspan="2">Function
[ ] Indicate the adjustment voltage output terminal</th><th colspan="2">Adjustment data</th></tr>
<tr><th>Initial value</th><th>Memo column</th></tr>
<tr><td>00</td><td>ID</td><td colspan="2">Set ID</td><td>00</td><td>2C</td></tr>
<tr><td>01</td><td>FADER LEVEL</td><td colspan="2">AE REF level modification during fader</td><td>E0</td><td>E0</td></tr>
<tr><td>02</td><td>FADER ENDTIM</td><td colspan="2">The setting of the AE REF modulation time during fader</td><td>10</td><td>10</td></tr>
<tr><td>03</td><td>CS SL</td><td colspan="2">Carrier balance adjustment</td><td>35</td><td></td></tr>
<tr><td>04</td><td>VSUB</td><td colspan="2">CCD imager V SUB adjustment</td><td>80</td><td></td></tr>
<tr><td>05</td><td>VPGH</td><td colspan="2">CCD imager VRG adjustment</td><td>80</td><td></td></tr>
<tr><td>06</td><td>VREF Y</td><td colspan="2">Camera core Y, C output D/A reference voltage, sync level adjustment</td><td>7B</td><td></td></tr>
<tr><td>07</td><td>VREF C</td><td colspan="2">Camera core CHROMA D/A standard voltage, BURST level adjustment</td><td>99</td><td></td></tr>
<tr><td>08</td><td>HALL GAIN</td><td>Hole amplifier gain adjustment</td><td rowspan="2">HALL adjustment</td><td>47</td><td></td></tr>
<tr><td>09</td><td>HALL OFFSET</td><td>Hole amplifier offset adjustment</td><td>71</td><td></td></tr>
<tr><td>0A</td><td>E LOWLIGHT START</td><td colspan="2">Low luminance intensity REF level modulation start setting</td><td>20</td><td>30</td></tr>
<tr><td>0B</td><td>REF 2V</td><td colspan="2">2V standard voltage for hole element</td><td>68</td><td>68</td></tr>
<tr><td>0C</td><td>AD REF</td><td colspan="2">Blacke level settihng during A/D conversion, and A/D off set Adjustment</td><td>72</td><td></td></tr>
<tr><td>0D</td><td>CORE DETH</td><td colspan="2">CCD correction control</td><td>04</td><td>04</td></tr>
<tr><td>0E</td><td>CORE VTR DELAY</td><td colspan="2">1HDL longitudinal setting during VTR playback</td><td>16</td><td>16</td></tr>
<tr><td>0F</td><td>CORE APCN4</td><td colspan="2">Horizontal aperture setting</td><td>A5</td><td>A5</td></tr>
<tr><td>10</td><td>CORE APCN5</td><td colspan="2">Vertical aperture setting</td><td>3D</td><td>3D</td></tr>
<tr><td>11</td><td>CORE EFECT</td><td colspan="2">Special effect control</td><td>A8</td><td>A8</td></tr>
<tr><td>12</td><td>CORE MATR</td><td colspan="2">BLUE matrix constant</td><td>27</td><td>27</td></tr>
<tr><td>13</td><td>CORE MATB</td><td colspan="2">RED matrix constant</td><td>6C</td><td>6C</td></tr>
<tr><td>14</td><td>CORE BURST LEVEL</td><td colspan="2">Burst flag level setting, color modulation ON/OFF
<table>
<tr><th>Data</th><th>Adjustment modeAdjustment</th></tr>
<tr><td>2C</td><td>Normal level</td></tr>
<tr><td>2E</td><td>Color modulation stopped</td></tr>
</table></td><td>2C</td><td>2C</td></tr>
<tr><td>15</td><td>CORE CHROMA DLY</td><td colspan="2">Y/C delay adjustment</td><td>08</td><td>08</td></tr>
<tr><td>16</td><td>CORE Y SETUP</td><td colspan="2">Set up level setting</td><td>08</td><td>08</td></tr>
<tr><td>17</td><td>CORE VHAPCN</td><td colspan="2">Slice and level setting of the aperture signal</td><td>17</td><td>17</td></tr>
<tr><td>18</td><td>CORE B-Y GAIN</td><td>B–Y GAIN</td><td rowspan="4">Color reproduction adjustments</td><td>13</td><td></td></tr>
<tr><td>19</td><td>CORE R-Y GAIN</td><td>R–Y GAIN</td><td>11</td><td></td></tr>
<tr><td>1A</td><td>CORE R-Y HUE</td><td>R–Y HUE</td><td>FF</td><td></td></tr>
<tr><td>1B</td><td>CORE B-Y HUE</td><td>B–Y HUE</td><td>FD</td><td></td></tr>
<tr><td>1C</td><td>CS/APCCUT</td><td colspan="2">Low luminance intensity aperture and chroma suppress level</td><td>22</td><td>22</td></tr>
</table>

Table 7-2 (1).

Address	Name	Function [ ] Indicate the adjustment voltage output terminal		Adjustment data	
				Initial value	Memo column
1D	NEXT LINE DEFECT BIT	CCD correction pattern	CCD imager correction data write	00	
1E	CCD DEFECT0	CCD correction data		00	
1F	CCD DEFECT1	CCD correction data		00	
20	CCD DEFECT2	CCD correction data		00	
21	CCD DEFECT3	CCD correction data		00	
22	CCD DEFECT4	CCD correction data		00	
23	CCD DEFECT5	CCD correction data		00	
24	CCD DEFECT6	CCD correction data		00	
25	CCD DEFECT7	CCD correction data		00	
26	CCD DEFECT8	CCD correction data		00	
27	CCD DEFECT9	CCD correction data		00	
28	CCD DEFECT10	CCD correction data		00	
29	CCD DEFECT11	CCD correction data		00	
2A	CCD DEFECT12	CCD correction data		00	
2B	CCD DEFECT13	CCD correction data		00	
2C	CCD DEFECT14	CCD correction data		00	
2D	RREF L	3200k Red standard data LSB	Auto white balance preset adjustment	72	
2E	RREF H	3200k Red standard data MSB		5F	
2F	GREF L	3200k Green standard data LSB		D4	
30	GREF H	3200k Green standard data MSB		63	
31	BREF L	3200k Blue standard data LSB		3B	
32	BREF H	3200k Blue standard data MSB		2C	
33	RCONTREF	3200k RCONT adjustment value	Pre-white balance adjustment	42	
34	BCONTREF	3200k BCONT adjustment value		4A	
35	AWB NOWM R	Red regular correction coefficient	Auto white balance adjustment	7E	
36	AWB NORM B	Blue regular correction coefficient		96	
37	AWB SHUT IN	Indoor determination shutter data		A8	A8
38	ABW SHUT OUT	Outdoor determination shutter data		A0	A0
39	AWB IRIS IN	Indoor determination hole data	IRIS IN/OUT adjustment	79	
3A	AWB IRIS OUT	Outdoor determination hole data		7F	
3B	AWB G LEVEL	High luminance section green integral level		02	02
3C	AWB G WIDTH	High luminance section green integral level range		03	03
3D	DMAT HUE	Variable linear matrix HUE coefficient	Linear matrix adjustment	00	
3E	DMAT GAIN	Variable linear matrix GAIN coefficient		00	
3F	AWB SELECT	AWB mode selection		00	00
40	AWB DIFF	Standard difference from the outdoor fixed value		0A	0A
41	AWB BOTTOM SLP R	AWB incoming frame bottom R coefficient		48	48
42	AWB BOTTOM SLP B	AWB incoming frame bottom B coefficient		78	78
43	AWB MIDDLE SLP R	AWB incoming frame middle R coefficient		60	60
44	AWB MIDDLE SLP B	AWB incoming frame middle B coefficient		40	40
45	AWB TOP SLP R	AWB incoming frame top R coefficient		66	66
46	AWB TOP SLP B	AWB incoming frame top B coefficient		18	18
47	AWB KEIKO R	AWB incoming frame fluorescent light R coefficient		66	66
48	AWB KEIKO B	AWB incoming frame fluorescent light B coefficient		18	18
49	AWB BOTTOM UP	AWB incoming frame bottom upper value		C2	C2

Table 7-2 (2).

<table>
<tr><th rowspan="2">Address</th><th rowspan="2">Name</th><th rowspan="2">Function
[ ] Indicate the adjustment voltage output terminal</th><th colspan="2">Adjustment data</th></tr>
<tr><th>Initial value</th><th>Memo column</th></tr>
<tr><td>4A</td><td>AWB BOTTOM DWN</td><td>AWB incoming frame bottom lower value</td><td>8C</td><td>8C</td></tr>
<tr><td>4B</td><td>AWB MIDDLE UP</td><td>AWB incoming frame middle upper value</td><td>AD</td><td>AD</td></tr>
<tr><td>4C</td><td>AWB MIDDLE DWN</td><td>AWB incoming frame middle lower value</td><td>96</td><td>96</td></tr>
<tr><td>4D</td><td>AWB TOP UP</td><td>AWB incoming frame top upper value</td><td>78</td><td>78</td></tr>
<tr><td>4E</td><td>AWB TOP DWN</td><td>AWB incoming frame top lower value</td><td>60</td><td>60</td></tr>
<tr><td>4F</td><td>AWB KEIKO</td><td>AWB incoming frame fluorescent light output lower value</td><td>66</td><td>66</td></tr>
<tr><td>50</td><td>AWB KEIKO DWN</td><td>AWB incoming frame fluorescent light lower value</td><td>59</td><td>59</td></tr>
<tr><td>51</td><td>AWB R TOP LMT</td><td>AWB incoming frame Rcont upper value</td><td>6E</td><td>6E</td></tr>
<tr><td>52</td><td>AWB R DWN LMT</td><td>AWB incoming frame Rcont lower value</td><td>20</td><td>20</td></tr>
<tr><td>53</td><td>AWB B TOP LMT</td><td>AWB incoming frame Bcont upper value</td><td>83</td><td>83</td></tr>
<tr><td>54</td><td>AWB B IN TOP</td><td>AWB incoming frame Bcont</td><td>67</td><td>67</td></tr>
<tr><td>55</td><td>AWB B IN MAX</td><td>AWB incoming frame Bcont</td><td>5C</td><td>5C</td></tr>
<tr><td>56</td><td>AWB B OUT MIN</td><td>AWB incoming frame Bcont</td><td>5C</td><td>5C</td></tr>
<tr><td>57</td><td>AWB B OUT DWN</td><td>AWB incoming frame Bcont</td><td>4A</td><td>4A</td></tr>
<tr><td>58</td><td>AWB B DWN LMT</td><td>AWB incoming frame Bcont lower value</td><td>1B</td><td>1B</td></tr>
<tr><td>59</td><td>AWB LL LMT</td><td>Low luminance intensity limiter</td><td>06</td><td>06</td></tr>
<tr><td>5A</td><td>AWB T M DIVID</td><td>AWB incoming frame upper, middle border value</td><td>5E</td><td>5E</td></tr>
<tr><td>5B</td><td>AWB B M DIVID</td><td>AWB incoming frame middle, lower border value</td><td>39</td><td>39</td></tr>
<tr><td>5C</td><td>AWB DELAY TM</td><td>AWB tracking speed<table><tr><th>Data</th><th>Adjustment mode</th></tr><tr><td>01</td><td>High speed tracking mode</td></tr><tr><td>0E</td><td>Normal</td></tr></table></td><td>0E</td><td>0E</td></tr>
<tr><td>5D</td><td>AWB FAST TM</td><td>AWB initial high speed tracking amount</td><td>40</td><td>40</td></tr>
<tr><td>5E</td><td>AWB OUT HYS OFF</td><td>AWB outdoor hysteresis off difference</td><td>0C</td><td>0C</td></tr>
<tr><td>5F</td><td>AWB OUT B HYS</td><td>AWB outdoor hysteresis amount</td><td>06</td><td>06</td></tr>
<tr><td>60</td><td>AWB MODE</td><td>AWB adjustment mode<table><tr><th>Data</th><th>Adjustment mode</th></tr><tr><td>00</td><td>Normal</td></tr><tr><td>D0</td><td>AWB adjustment mode</td></tr><tr><td>F1</td><td>Sampling display mode</td></tr></table></td><td>00</td><td>00</td></tr>
<tr><td>61</td><td>AE REFL</td><td>Reference value (lower) for AE</td><td>00</td><td>00</td></tr>
<tr><td>62</td><td>AE REFH</td><td>Reference value (upper) for AE</td><td>18</td><td>18</td></tr>
<tr><td>63</td><td>AGC MIN</td><td>AGC MIN value (AGCREF value), IRIS level adjustment</td><td>E3</td><td></td></tr>
<tr><td>64</td><td>AE MIML</td><td>Low luminance intensity side limiter (MAXGAIN), MAX GAIN adjustment</td><td>32</td><td></td></tr>
<tr><td>65</td><td>AE MAXL</td><td>High luminance intensity side limiter (lower)</td><td>80</td><td>80</td></tr>
<tr><td>66</td><td>IRIS OFFSET</td><td>Iris ROM table OPEN side off set</td><td>D0</td><td>D0</td></tr>
<tr><td>67</td><td>AE KEISU</td><td>Correction coefficient during detection weighting</td><td>00</td><td>00</td></tr>
<tr><td>68</td><td>AE FUNCTION</td><td>SW for turning each AE function ON and OFF</td><td>00</td><td>00</td></tr>
<tr><td>69</td><td>BL HOSEIH</td><td>Forcible back light level setting (upper)</td><td>40</td><td>40</td></tr>
<tr><td>6A</td><td>JITEISU DOWN</td><td>Constant during loop response DOWN side</td><td>30</td><td>30</td></tr>
<tr><td>6B</td><td>JITEISU UP</td><td>Constant during loop response UP side</td><td>10</td><td>10</td></tr>
<tr><td>6C</td><td>AE KNEE</td><td>KNEE setting value for AE</td><td>FF</td><td>FF</td></tr>
<tr><td>6D</td><td>ORETEN SET</td><td>Variable point due to time constant error amount</td><td>13</td><td>13</td></tr>
</table>

Table 7-2 (3).

Address	Name	Function [ ] indicate the adjustment voltage output terminal	Adjustment data	
			Initial value	Memo column
6E	OMOMIOUT	Outer frame weighting amount	40	40
6F	AFC WIDE	Coefficient required for the ANF integral loop	03	03
70	AFC GAIN	Loop gain of the flickerless loop	01	01
71	AFC LIMIL	Limiter corresponding to the error rate (Lower)	60	60
72	HIST P KEISU	Histocomp level setting P for counter light determination	20	20
73	HIST H KEISU	Histocomp level setting H for counter light determination	E0	E0
74	HIST L KEISU	Histocomp level setting L for counter light determination	90	90
75	GYKOU JITEISU	Constant during auto back light response	08	08
76	SUBN LIMIT	Limiter for counter light determination	40	40
77	FUZZY RULE1	Correction amount 1 for auto back light	90	90
78	FUZZY RULE2	Correction amount 2 for auto back light	C0	C0
79	FUZZY RULE3	Correction amount 3 for auto back light	B0	B0
7A	FUZZY RULE4	Correction amount 4 for auto back light	A0	A0
7B	FUZZY RULE5	Correction amount 5 for auto back light	70	70
7C	FUZZY RULE6	Correction amount 6 for auto back light	80	80
7D	FUZZY RULE7	Correction amount 7 for auto back light	A0	A0
7E	FUZZY RULE8	Correction amount 8 for auto back light	98	98
7F	FUZZY RULE9	Correction amount 9 for auto back light	90	90
80	FUZZY RULE10	Correction amount 10 for auto back light	78	78
81	IRIS MIN L	Iris limit value for small iris (Lower)	80	80
82	IRIS MIN H	Iris limit value for small iris (Upper)	02	02
83	DELTA SHUTGAIN	Smoothing amount setting	04	04
84	AE WAKUH	Frame data for AE detection (vertical line)	0F	0F
85	AE WAKUV	Frame data for AE detection (horizontal line)	4F	4F
86	WIDE LIMIT	ZOOM limiter WIDE (lower) Flange back adjustment	00	
87	WIDE LIMIT	ZOOM limiter WIDE (upper)	00	
88	TELE LIMIT	ZOOM limiter TELE (lower)	00	
89	TELE LIMIT	ZOOM limiter TELE (upper)	04	
8A	STEP ZERO	Flange back value	60	
8B	THERMO INIT	Temperature data initial value	6D	
8C	SCHAR COR1	S distortion correction data 1	00	
8D	SCHAR COR2	S distortion correction data 2	00	
8E	SCHAR COR3	S distortion correction data 3	00	
8F	ZS INIT FAST	Zoom speed initial value (fast)	7D	7D
90	ZMSPD DAMIN	Zoom speed D/A MIN value	3D	3D
91	ZS K	Zoom servo coefficient K	12	12
92	ZS L	Zoom servo coefficient L	02	02
93	ZP HYS	Zoom potential hysteresis	05	05
94	MOTOR ABILITY	Step motor MAX SPEED	07	07
95	AF MD2THL	MODE2 THR	20	20
96	MAXCHG THR	MAX value renewal THR	1A	1A
97	ERR THRL	Wobbling width THR	18	18
98	WOB INTV	Wobbling second interval	04	04
99	ERRPOL THR	MODE2 error possible THR	13	13

Table 7-2 (4).

Note 3: The [ ] is camera micro processor version 1, refer to [Page F Data Modification] on page for how to distinguish the versions.

Note 4: The 〈 〉 is camera micro processor version 5.

<table>
<tr><th rowspan="2">Address</th><th rowspan="2">Name</th><th rowspan="2">Function
[ ] Indicate the adjustment voltage output terminal</th><th colspan="2">Adjustment data</th></tr>
<tr><th>Initial value</th><th>Memo column</th></tr>
<tr><td>9A</td><td>MAXCHK THR</td><td>MAX CHECK THR</td><td>12</td><td>12</td></tr>
<tr><td>9B</td><td>REWOB THR</td><td>Wobbling second THR</td><td>0A</td><td>0A</td></tr>
<tr><td>9C</td><td>MODE2 INOUT</td><td>MODE2 speed switchover</td><td>80</td><td>80</td></tr>
<tr><td>9D</td><td>SMLWD THR</td><td>Small frame THR</td><td>0A</td><td>0A</td></tr>
<tr><td>9E</td><td>ZOOM PULSE LIMIT</td><td>Maximum zoom pulse value</td><td>C9</td><td>C9</td></tr>
<tr><td>9F</td><td>ZOOM RISE</td><td>Zoom rise minimum speed time</td><td>0A</td><td>0A</td></tr>
<tr><td>A0</td><td>THERMO K BASE</td><td>Temperature correction coefficient</td><td>03</td><td>03</td></tr>
<tr><td>A1</td><td>FB FOCUST</td><td>Constant for flange back adjustment</td><td>B3</td><td>B3</td></tr>
<tr><td>A2</td><td>THERMO K SLOPE</td><td>Temperature correction coefficient</td><td>00</td><td>00</td></tr>
<tr><td>A3</td><td>ZOM SPD FAST</td><td>Zoom speed (fast)</td><td>18</td><td>18</td></tr>
<tr><td>A4</td><td>LIMITREST WIDE</td><td>Zoom limiter WIDE side</td><td>0C</td><td>0C</td></tr>
<tr><td>A5</td><td>LIMITREST TELE</td><td>Zoom limiter TELE side</td><td>06</td><td>06</td></tr>
<tr><td>A6</td><td>FB PEAKTHR</td><td>Constant for flange back adjustment</td><td>FF</td><td>FF</td></tr>
<tr><td>A7</td><td>FB OHK T RESTO</td><td>Constant for flange back adjustment</td><td>05</td><td>05</td></tr>
<tr><td>A8</td><td>DET IRIS ALT</td><td>Iris variation check THR</td><td>02</td><td>02</td></tr>
<tr><td>A9</td><td>DET AGC ALT</td><td>AGC variation check THR</td><td>02</td><td>02</td></tr>
<tr><td>AA</td><td>LIMIT INSURANCE</td><td>Focus limiter insurance value</td><td>05</td><td>05</td></tr>
<tr><td>AB</td><td>FOCUS MODE</td><td>Focus mode<table><tr><th>Data</th><th>Adjustment mode</th></tr><tr><td>08</td><td>Zoom, Focus fixed</td></tr><tr><td>00</td><td>Normal</td></tr></table></td><td>00</td><td>00</td></tr>
<tr><td>AC</td><td>LENS ADJ MOD</td><td>Flange back adjustment mode<table><tr><th>Data</th><th>Adjustment mode</th></tr><tr><td>00</td><td>Nomal</td></tr><tr><td>01</td><td>Flange back adjustment</td></tr></table></td><td>00</td><td>00</td></tr>
<tr><td>AD</td><td>ELENS EMRG</td><td>Lens emergency</td><td>00</td><td>00</td></tr>
<tr><td>AE</td><td>NTSC PAL/H DEF</td><td>DELAY bit=0: NTSC, 1: PAL, bit4-7=CCD correction delay</td><td>20</td><td>20</td></tr>
<tr><td>AF</td><td>FT SW</td><td>DDS display mode switchover<table><tr><th>Data</th><th>DDS display mode</th></tr><tr><td>00</td><td>Y sampling display</td></tr><tr><td>03</td><td>R-Y, B-Y display</td></tr><tr><td>40</td><td>HALL data display</td></tr><tr><td>82</td><td>R ratio display</td></tr><tr><td>83</td><td>b ratio display</td></tr><tr><td>91</td><td>R.B ratio (M) display</td></tr><tr><td>B0</td><td>Focus step display</td></tr></table></td><td>00</td><td>00</td></tr>
<tr><td>B0</td><td>CORE OTHER</td><td></td><td>12</td><td>12</td></tr>
<tr><td>B1</td><td>CORE YGAIN</td><td>Core field data 0 byte gain</td><td>3F</td><td>3F</td></tr>
<tr><td>B2</td><td>LOW LIGHT CS</td><td>Low light color killer starting point</td><td>C0</td><td>C0</td></tr>
<tr><td>B3</td><td>FB CHK T REST 1</td><td>Constant for flange back adjustment</td><td>24</td><td>24</td></tr>
<tr><td>B4</td><td>E LOW LIGHT START 2</td><td>Low light REF level modulation start design 2</td><td>80</td><td>80</td></tr>
<tr><td>B5</td><td>E LOW LIGHT LEVEL</td><td>Low light REF level modulation level setting</td><td>F0</td><td>F0</td></tr>
</table>

Table 7-2 (5).

Address	Name	Function [ ] Indicate the adjustment voltage output terminal	Adjustment data	
			Initial value	Memo column
B6	ZOOM DROP 1	F-No. dopping (1) by zoom lens	49	49
B7	ZOOM DROP 2	F-No. dropping (2) by zoom lens	60	60
B8	LOW LIGHT POINT	Color killer starting point	20	20
B9	not used			
BA	AWB IN B byS	B-hysteresis level at indoor AWB	04	04
BB	AWB IN R byS	R-hysteresis level at indoor AWB	02	02
BC	AWB KAKE NOM R	Multiplication with adr:35nomB is 1000h reference	20	20
BD	AWB KAKE NOM B	Multiplication with adr:36nomB is 1000h reference	20	20
BE	MF STEP CHNGE	Coefficient of MODE2 THE	06	06
BF	ZOOM SPEED SUPER	Zoom speed (for adjustment)	7D	7D
C0	ZOOM INT SUPER SLOW	Zoom speed initial value (Super low speed)	7D	7D
C1	AF CONTROL FLAG		FC	FC
C2	AE Y THR	Low luminous intensity AE Y THR1	40	40
C3	AE Y MIN	Low luminous intensity AE Y THR2	18	18
C4	MD2 SPD	Focus speed at MODE 2	41	41
C5	AE CHECK	THR for activating re-start up from MODE 7, 8	30	30
C6	LOWCON THR1	THR1 for judging LOW CON at MODE 2	20	20
C7	LOWCON THR2	THR2 for judging LOW CON at MODE 2	20	20
C8~EF		Not used		
F0		Input column of the unit ID No., etc. Not related to unit operations.	FF	
F1			FF	
F2			FF	
F3			FF	
F4			FF	
F5			FF	
F6			FF	
F7			FF	
F8			FF	
F9			FF	
FA			FF	
FB			FF	
FC			FF	
FD			FF	
FE			FF	
FF			FF	

Table 7-2 (6).

7-1-6. 6 Page, 1 Page Address List

The camera adjustment mode can be set by performing the following data settings at page: 6 or page: 1. (These page data can be set temporary, but when the main power (6.3V) is turned off, the original value (normal value) will be returned. Therefore, these adjustment modes can be released very simply by turning the main power off.)

(Example) The camera adjustment mode (window OFF) is set by setting data: 01 to page: 6, address: 00. The F page write protect will also be released.

1. Page 6

Address	Adjustment Mode	Data	Function
00	Camera adjustment mode	01 10 11	Camera adjustment mode (window OFF), F page write protect released Normal Camera adjustment mode (window ON), F page write protect released
01	Camera adjustment switch **Note:** To set this address adjustment mode, it is necessary to press the PAUSE button of the adjusting remote control unit after setting the data.	00 01 03 05 07 09 0B 0D 0F 11 13 15 1F	Normal IRIS OPEN, AGC HOLD IRIS CLOSE1, AGC HOLD IRIS CLOSE2, AGC MIN IRIS CLOSE3, AGC MAX ND0.5 SHUTTER (PAL=1/160, NTSC=1/190) ND0.8 SHUTTER (PAL=1/320, NTSC=1/380) AWB PRESET1: 3200K PRESET DATA take in WB 3200K PRESET: Indoor white balance mode AWB PRESET2: 3200K PRESET DATA take in ZOOM HUNTING1 ZOOM SPDSLOW ZOOM HUNTING2 ZOOM SPDFAST EEPROM PRE WRITE: Page F initial data write
05	Shutter mode	00 15	NTSC=1/60, PAL=1/50 NTSC=1/2000, PAL=1/2000
08	ZOOM speed SLOW/FAST	00 01 02 03	Normal ZOOM speed SLOW (10 second) ZOOM speed FAST (3.5 second) ZOOM speed SLOW (10 second)
09 ★	COMPLEATED FLAG	00 01	Camera Adjustment not completed Camera adjustment completed
11 ★	ROM VERSION	01 02 04	Camera micro processor ver1 Camera micro processor ver2, ver3 Camera micro processor ver4

Addresses with ★ are exclusively for reading.

Table 7-3.

2. Page 1

Address	Adjustment Mode	Data	Function
E6	VH address L		Title horizontal/vertical position (L)
E7	VH address H		Title horizontal/vertical position (H)

Table 7-4.

7-1-7. Adjustment Connector

Most of the measuring points for the camera section adjustment are concentrated on CN701 of the CS-44 board. Connect the oscilloscope and etc. via the measuring pin (J-6082-139-A). The following table lists the terminal numbers and the signal names of CN701.

Terminal Number	Signal Name	Terminal Number	Signal Name
1	EVER 5V	2	NC
3	ZOOM SW	4	CAM SI
5	$\overline{\text{CS ROM}}$	6	CAM SO
7	$\overline{\text{CS OPD}}$	8	$\overline{\text{CAM SCK}}$
9	$\overline{\text{CS CORE}}$	10	GND
11	IRIS OUT	12	NC
13	V SUB CHK	14	C OUT
15	PG CONT	16	GND
17	NC	18	Y OUT

Table 7-5.

7-1-8. Data Processing

The calculation of the DDS display and the adjusting remote control unit display data (hexadecimal notation) are required for obtaining the adjustment data of some adjustment items. In this case, after converting the hexadecimal notation to decimal notation, calculate and convert the result to hexadecimal notation, and use it as the adjustment data. Table 7-6. indicates the hexadecimal notation-the decimal notation calculation table.

Hexadecimal notation-Decimal notation

②

The lower digits of the hexadecimal notation The upper digits of the hexadecimal notation	0	1	2	3	4	5	6	7	8	9	A (A)	B (b)	C (c)	D (d)	E (E)	F (F)
0	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
1	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31
2	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47
3	48	49	50	51	52	53	54	55	56	57	58	59	60	61	62	63
4	64	65	66	67	68	69	70	71	72	73	74	75	76	77	78	79
5	80	80	82	83	84	85	86	87	88	89	90	91	92	93	94	95
6	96	97	98	99	100	101	102	103	104	105	106	107	108	109	110	111
7	112	113	114	115	116	117	118	119	120	121	122	123	124	125	126	127
8	128	129	130	131	132	133	134	135	136	137	138	139	140	141	142	143
9	144	145	146	147	148	149	150	151	152	153	154	155	156	157	158	159
A (A)	160	161	162	163	164	165	166	167	168	169	170	171	172	173	174	175
① B (b)	176	177	178	179	180	180	182	183	184	185	186	187	188	189	190	191
C (c)	192	193	194	195	196	197	198	199	200	201	202	203	204	205	206	207
D (d)	208	209	210	211	212	213	214	215	216	217	218	219	220	221	222	223
E (E)	224	225	226	227	228	229	230	231	232	233	234	235	236	237	238	239
F (F)	240	241	242	243	244	245	246	247	248	249	250	251	252	253	254	255

Note: ( ) indicate the adjusting remote control unit display.

(Example) In the case that the DDS display and the adjusting remote control unit display are BD (b d).
As the upper digit of the hexadecimal notation is B (b), and the lower digit is D (d), the intersection "189" of the ① and ② in the above table is the decimal notation to be calculated.

Table 7-6.

7-2. CAMERA SYSTEM ADJUSTMENT

1. Power Supply Voltage Check (PS-312 board)

Subject	Option
Measuring instrument	Digital voltmeter
D5V check	
Measurement point	Pins ⑰ and ⑱ of CN950
Specified value	4.98 ± 0.15 Vdc
D4V check	
Measurement point	Pins ⑮ and ⑯ of CN950
Specified value	4.03 ± 0.15 Vdc
CAM 5V check	
Measurement point	Pins ⑬ and ⑭ of CN950
Specified value	4.90 ± 0.15 Vdc
15V check	
Measurement point	Pin ⑪ of CN950
Specified value	15.04 ± 0.4 Vdc
-9V check	
Measurement point	Pin ⑫ of CN950
Specified value	− 8.5 ± 0.4 Vdc

Checking method:

1) Check that each power supply voltage satisfies the specified value.

2. Page F Data Initialization

Note: It is necessary to perform all adjustments of the camera section from the beginning again if the data of page F has been initialized.

Initializing method:

1) Release the protect.
   Page: 6, address: 00, data: 01.
2) Check that the data of page: 6, address: 09 is 00.
   (Display indicating that page F data can be initialized)
3) Set data: 21 to page: 6, address: 01, and press the PAUSE button of the adjusting remote control unit.
   (Page F data initialization execution.
   The data of all addresses of page F will be initialized.)
4) Check that the data of page: 6, address: 09 is 01.
   (Displays that the initialization of page F data has been completed)
5) Set data: 00 to page: 6, address: 01. and press the PAUSE button of the adjusting remote control unit.
   (Releases the page F data initialization mode)
6) After performing "Page F data modification", perform all the adjustments of the camera section (page F).

3. Page F Data Modification

The data (initial data) that is automatically written on page F after the initialization of the page F data will differ according to some camera micro processor versions. Change the data by manual input, and arrange it.

Note: When changing the data, to write the data to the non-volatile memory, press the PAUSE button of the adjusting remote control unit every time the new data is set.

In the case of camera micro processor Ver.1, Ver.2, Ver.3 and Ver.4, change the data listed below.
Ver. 5 is not required data modification.

Address	**Data**
A0 (THERMO K BASE)	03
B6 (ZOOM DROP1)	49
B7 (ZOOM DROP2)	60

[Distinguishing the Camera Micro Computer (IC709) Versions]

Each version can be distinguished by looking at the part name of the camera micro processor or the data of page: 6, address: 11.

Version	**Part Name**	**Page:6 Address:11**
Ver.1	CXP80624-455Q	01

4. 28 MHz Orijinal Oscillation Adjustment (CS-44 board)

Subject	Not required
Measurement Point	CL821 (pin (57) of IC801)
Measuring Instrument	Frequency counter
Adjusting Element	CT801
Specified Value	14318181 ± 71 Hz

Adjusting method:

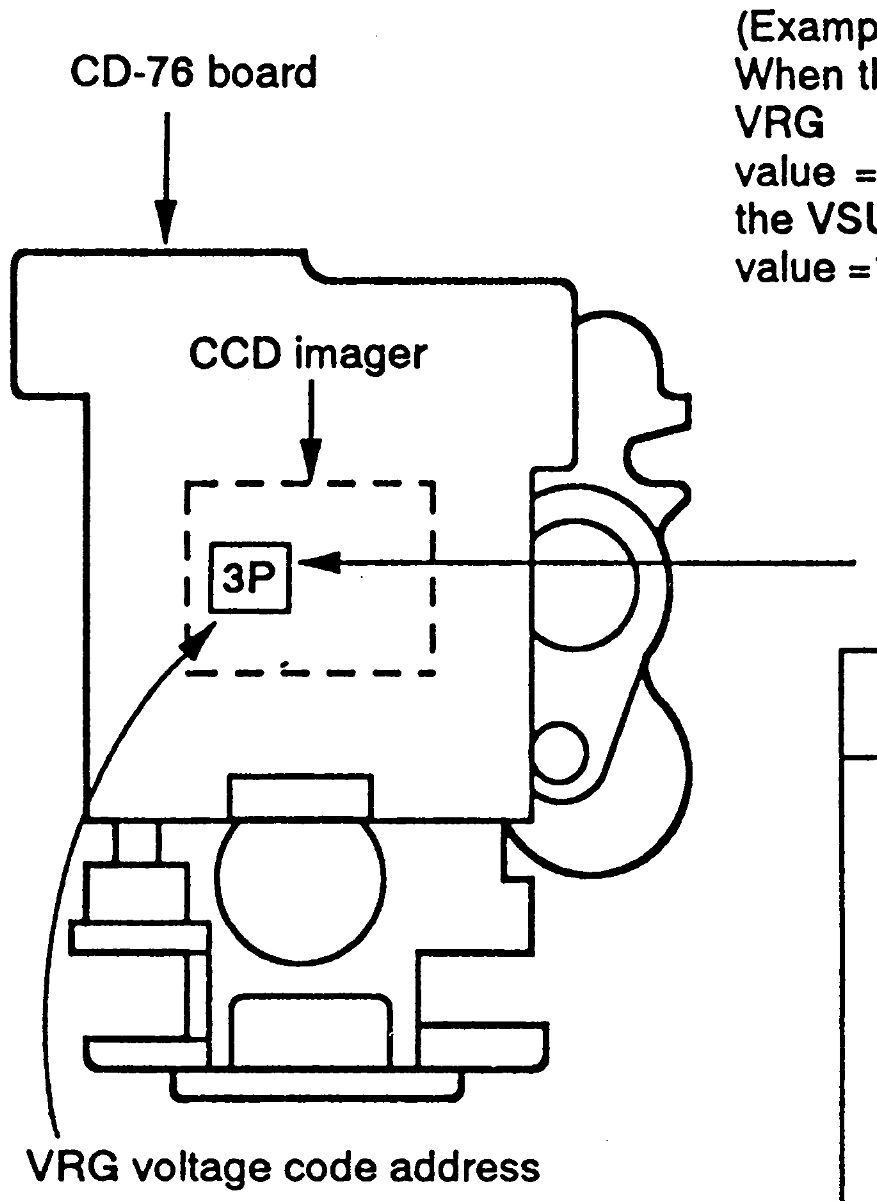
1) Use CT801 to adjust the oscillation frequency to 14318181 ± 71 Hz.

5. V SUB Adjustment (CS-44 board)

Subject	Not required
Measurement Point	Pin ⑬ of CN701 (V SUB CHK)
Measuring Instrument	Digital voltmeter
Adjustment Page	F
Adjustment Address	04 (V SUB)
Specified Value	(Imager display voltage) ± 0.1 Vdc

Adjusting method:

1) Release the protect.
   Page: 6, address: 00, data: 01
2) Change the data of page: F, address: 04, and adjust the voltage of pin ⑬ of CN701 to (imager display voltage) ± 0.1 Vdc.
3) Press the PAUSE button of the adjusting remote control unit.



(Example)
When the display is 3P, the VRG voltage specified value =2.0 ± 0.1 Vdc, and the VSUB voltage specified value =13.5 ± 0.1 Vdc.

VSUB voltage code address

Code address	Voltage (Vdc)
E	9.0
F	9.5
G	10.0
H	10.5
J	11.0
K	11.5
L	12.0
M	12.5
N	13.0
P	13.5
Q	14.0
R	14.5
S	15.0
T	15.5
U	16.0
V	16.5
W	17.0
X	17.5
Y	18.0
Z	18.5

VRG voltage code address

Code address	Voltage (Vdc)
1	1.0
2	1.5
3	2.0
4	2.5
5	3.0
6	3.5
7	4.0

Fig. 7-7.

6. VRG Adjustment (CS-44 board)

Subject	Not required
Measurement Point	Pin ⑮ of CN701 (PG CONT)
Measuring Instrument	Digital voltmeter
Adjustment Page	F
Adjustment Address	05 (VRG)
Specified Value	(Imager display voltage) ± 0.1 Vdc

Adjusting method:

1) Release the protect.
   Page: 6, address: 00, data: 01
2) Change the data of page: F, address: 05, and adjust the voltage of pin ⑮ of CN701 to (imager display voltage) ± 0.1 Vdc.
3) Press the PAUSE button of the adjusting remote control unit.

7. CCD Imager Correction Data write

Subject	Not required
Adjustment Page	F
Adjustment	1D to 2C (CCD-DEFECT)

Perform CCD imager correction data write in the following cases.

1. When the CCD imager has been replaced
2. The ocassion of exchaning a camera micro processor or EEPROM (IC712).
3. When the page F data has been initialized

In the case of 1, as the correction data is not required for the CCD imager for repair, adjust all data of addresses 1D to 2C to "00".

In the case of 2 and 3, write the correction data attached to the shield case of PS-312 board to addresses 1D to 2C.

If the correction data are not attached, adjust all data of addresses 1D to 2C to "00".

Adjusting method:

1) Release the protect.
   Page: 6, address: 00, data: 01
2) Write the correction data to page: F, addresses: 1D to 2C.
   Note: To perform write to the non-volatile memory, press the PAUSE button of the adjusting remote control unit.

Processing after completing adjustments

1) If the CCD imager has been replaced, remove the old correction data label attached on the shield case (UPPER) of PS-312 board.

8. HALL Adjustment

Subject	Not required
Measurement Point	DDS display of EVF or monitor TV
Measuring Instrument	
Adjustment Page	F
Adjustment Address	08 (HALL GAIN) 09 (HALL OFFSET)
Specified Value	31 TO 35 during IRIS OPEN B1 to B5 during IRIS CLOSE

Adjusting method:

1) Release the protect.
   Page: 6, address: 00, data: 01
2) Set data: 40 to page: F, address: AF, and press the PAUSE button of the adjusting remote control unit.
   (HALL output display mode setting)
3) Set data: 03 to page: 6, address: 01, and press the PAUSE button of the adjusting remote control unit.
   (IRIS CLOSE mode setting)
4) Set data: 40 to page: F, address: 08, and press the PAUSE button of the adjusting remote control unit.
5) Read the DDS display data (the bottom two digits of the display data at the bottom right of the EVF or the monitor TV display), and set to W_2.
6) Set data: 30 to page: F, address: 08, and press the PAUSE button of the adjusting remote control unit.
7) Read the DDS display data, and set to W_1.
8) Set data: 01 to page: 6, address: 01, and press the PAUSE button of the adjusting remote control unit.
   (IRIS OPEN mode setting)
9) Read the DDS display data, and set to K_1.
10) Set data: 40 to page: F, address: 08, and press the PAUSE button.
11) Read the DDS display data, and set to K_2.
12) Convert W_1, W_2, K_1, K_2 to decimal notation, and obtain W_1', W_2', K_1', K_2'. (Refer to Table 7-6. "Hexadecimal notation-decimal notation conversion table".)
13) Calculate X_1' using the following equations (decimal notation calculation).
   $A'=W_2'+K_1'-W_1'-K_2'$ ··························Equation 1
   $B'=W_1'-K_1'$ ···Equation 2
   $X_1'=\dfrac{2048+(48\times A')-(16\times B')}{A'}$ ················Equation 3
14) Convert X_1' to hexadecimal notation, and obtain X_1.
   (Round off to one decimal place)
15) Set data: X_1 to page: F, address: 08, and press the PAUSE button of the adjusting remote control unit.
16) Change the data of page: F, address: 09, and adjust the DDS display data to "33".
17) Press the PAUSE button of the adjusting remote control unit.
18) Set data: 03 to page: 6, address: 01, and press the PAUSE button of the adjusting remote control unit.
   (IRIS CLOSE mode setting)
19) Read the DDS display data, and set to W_0. If W_0 lies within the "B1" to "B5" range, perform "Processing after completing adjustments". If it lies outside the range, perform the following adjustments.
20) Convert W_0 to decimal notation, and obtain W_0'.
21) Calculate X_2' using the following equations (decimal notation calculation).
   $C'=W_0'-B'-51$ ····································Equation 4
   $X_2'=\dfrac{(128-B')\times(X_1'-48)+48\times C'}{C'}$ ············Equation 5
   (X_1' and B' are values obtained from equations 2 and3)
22) Convert X_2' to hexadecimal notation and obtain X_2.
   (Round off to one decimal place)
23) Set data X_2 to page: F, address: 08, and press the PAUSE button of the adjusting remote control unit.
24) Change the data of page: F, address: 09, and adjust the DDS display data to "B3".
25) Press the PAUSE button of the adjusting remote control unit.
26) Set data: 01 to page: 6, address: 01, and press the PAUSE button of the adjusting remote control unit.
   (IRIS OPEN mode setting)
27) Check that the DDS display data lies within the "31" to "35" range.

Processing after Completing Adjustments

1) Set data: 00 to page: 6, address: 01, and press the PAUSE button of the adjusting remote control unit.
   (IRIS NORMAL mode setting)

9. Flange Back Adjustment

Subject	Chart for flange back adjustment (1m from the front side of the lens Luminance:300 ± 50lux)
Measurement Point	Check the operations on the TV motor
Measuring Instrument	
Adjustment Page	F
Adjustment Address	8A(STEP ZERO), 8B(THERMO INIT) 8C(SCHAR COR1) 8D(SCHAR COR2) 8E(SCHAR COR3) 86(WIDE LIMIT), 87(WIDE LIMIT H), 88(TELE LIMIT), 89(TELE LIMIT H)

Adjusting method:

1) Turn the auto focus off.
2) Adjust the focus using the focus ring.
3) Check that the flange back adjustment chart center and the exposure display center coincide at both zoom lens TELE end and WIDE end.
4) Release the protect.
   Page: 6, address: 00, data: 01
5) Check that the data of page: 6, address: 09 is 00.
   (Flange back adjustment possible display)
6) Check that the page: F, address: 86 to 8B data is at the initial value. (Refer to Table 7-2. "Page F address list")
7) Set data: 01 to page: F, address: AC.
   (This causes automatic adjustment to be performed. Adjustments are performed at the zoom lens TELE end first, and then at the WIDE end. The adjustment data is automatically input to page: F, addresses: 86 to 8A.)
8) Check that the data of page: 6, address: 09 is 01.
   (Display indicating flange back adjustment completion)

Processing after completing adjustments

1) Set data: 00 to page: F, address: AC.
2) Turn off the main power supply (6.3V).

10. Flange Back Check

Subject	Siemens star (1m from the front of the lens)
Measurement Point	DDS display of EVF or TV monitor
Measuring Instrument	
Specified Value	$D_2=D_1 \pm 5$ $D_4=D_3 \pm 5$

Checking method:

1) Set data: 11 to page: 6, address: 00. (Camera adjustment (Window ON) mode)
2) Set data: B0 to page: 6, address: AF. (Focus step display mode)
3) Place the Siemens star 1m from the front of the lens.
4) To open the IRIS, decrease the luminous intensity to the Siemens star up to a point before noise appears on the image.
5) Turn off the auto-focus.

- Checking the flange back at the center point of the zoom.

6) Shoot the Siemens star with the zoom TELE end.
7) Rotate the focus ring, and adjust the focus.
8) Adjust to the center point of the zoom.
   (Adjust to the center point by viewing the EVF zoom position.)
9) Read the focus step value (4 digits) displayed on the TV monitor, and take the value as D_1.
10) Rotate the focus ring, and adjust the focus.
    Read the focus step value here, and take the value as D_2.
11) Check that $D_2=D_1 \pm 5$.

- Checking the flange back at the zoom WIDE end.

12) Shoot the Siemens star at the zoom TELE end.
13) Rotate the focus ring, and adjust the focus.
14) Adjust to the zoom WIDE edge.
15) Read the focus step value displayed on the TV monitor, and take the value as D_3.
16) Rotate the focus ring, and adjust the focus.
    Read the focus step value here, and adjust to D_4.
17) Check that $D_4=D_3 \pm 5$.

Process after checking

1) Set data: 00 to page: F, address: AF, and press the PAUSE button of the adjusting remote control unit.

11. SYNC Level Adjustment (CS-44 board)

Subject	Not required
Measurement Point	Pin ⑱ of CN701 (Y OUT)
Measuring Instrument	Oscilloscope
Adjustment Page	F
Adjustment Address	06 (VREF-Y)
Specified Value	A=140 ± 5 mV

Adjusting method:

1) Release the protect.
   Page: 6, address: 00, data: 01
2) Set data: 05 to page: 6, address: 01, and press the PAUSE button of the adjusting remote control unit.
   (IRIS CLOSE mode setting)
3) Change the data of page: F, address: 06, and adjust so that the SYNC level (A) becomes the specified value.
4) Press the PAUSE button of the adjusting remote control unit.

Processing after completing adjustments

1) Set data: 00 to page: 6, address: 01, and press the PAUSE button of the adjusting remote control unit.
   (Release of IRIS CLOSE mode)

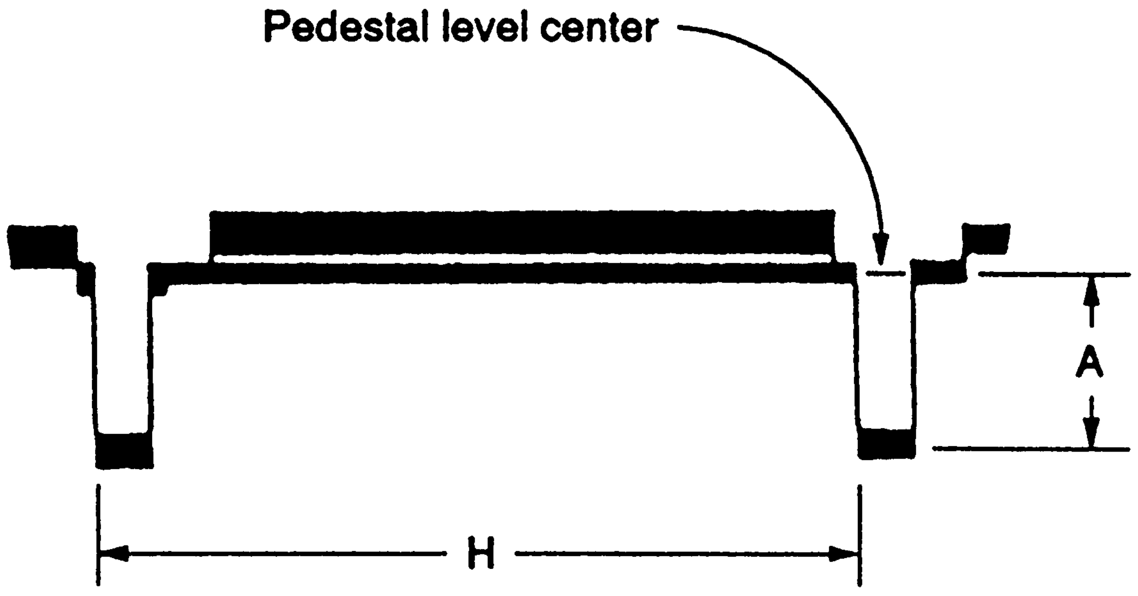


Fig. 7-8.

12. BURST Level Adjustment (CS-44 board)

Subject	Not required
Measurement Point	Pin ⑭ of CN701 (C OUT)
Measuring Instrument	Oscilloscope
Adjustment Page	F
Adjustment Address	07 (VREF-C)
Specified Value	A=140 ± 5 mVp-p

Adjusting method:

1) Release the protect.
   Page: 6, address: 00, data: 01
2) Set data: 05 to page: 6, address: 01, and press the PAUSE button of the adjusting remote control unit.
   (IRIS CLOSE mode setting)
3) Change the data of page: F, address: 07, and adjust so that the burst level (A) becomes the specified value.
4) Press the PAUSE button of the adjusting remote control unit.

Processing after completing adjustments

1) Set data: 00 to page: 6, address: 01, and press the PAUSE button of the adjusting remote control unit.
   (Release of IRIS CLOSE mode)

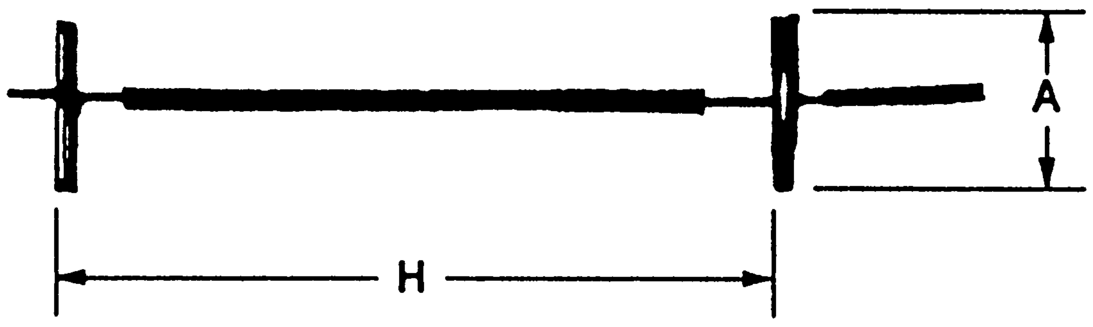


Fig. 7-9.

13. A/D Offset Adjustment

Subject	Not required
Measurement Point	DDS display on the EVF or the TV monitor
Measuring Instrument	
Adjustment Page	F
Adjustment Address	0C (AD REF)
Specified Value	40 to 41

Adjusting method:

1) Release the protect.
   Page: 6, address: 00, data: 01
2) Set data: 05 to page: 6, address: 01, and press the PAUSE button of the adjusting remote control unit.
   (IRIS CLOSE AGC MIN mode setting)
3) Set data: 00 to page: F, address: AF, and press the PAUSE button of the adjusting remote control unit.
   (Y sampling output mode setting)
4) Set data: 00 to page: F, address: 16, and press the PAUSE button of the adjusting remote control unit.
   (Sets the SET UP level to 0)
5) Set data: 35 to page: 1, address: E6.
   (Setting 1 of the sampling position)
6) Set data: 6D to page: 1, address: E7.
   (Setting 2 of the sampling position)
7) Change the data of page: F, address: 0C, and adjust the average value of the DDS display (the bottom two digits of the display data at the bottom right of the EVF or the TV monitor display) to 40 to 41.
   (Set the data of address 0C to the maximum value satisfying the specification.)
8) Press the PAUSE button of the adjusting remote control unit.

Processing after completing adjustments

1) Set data: 08 to page: F, address: 16, and press the PAUSE button of the adjusting remote control unit.
   (Returns the SET UP level to the normal level.)
2) Turn the main power supply (6.3V) off.

14. Carrier Balance Adjustment

Subject	Not required
Measurement Point	Video output terminal
Measuring Instrument	Vectorscope
Adjustment Page	F
Adjustment Address	03 (CS SL)
Specified Value	The center of the black luminance point should lie within the 1 ϕ circle whose center is the principle point.

Adjusting method:

1) Release the protect.
   Page: 6, address: 00, data: 01.
2) Set data: 07 to page: 6, address: 01, and press the PAUSE button of the adjusting remote control unit.
   (IRIS CLOSE, AGC MAX mode setting)
3) Change the data of page: F, address: 03, and adjust so that the center of the black luminance point coincides with the principle point.
4) Press the PAUSE button of the adjusting remote control unit.

Processing after completing adjustments

1) Set data: 00 to page: 6, address: 01, and press the PAUSE button of the adjusting remote control unit.
   (IRIS NORMAL mode setting)

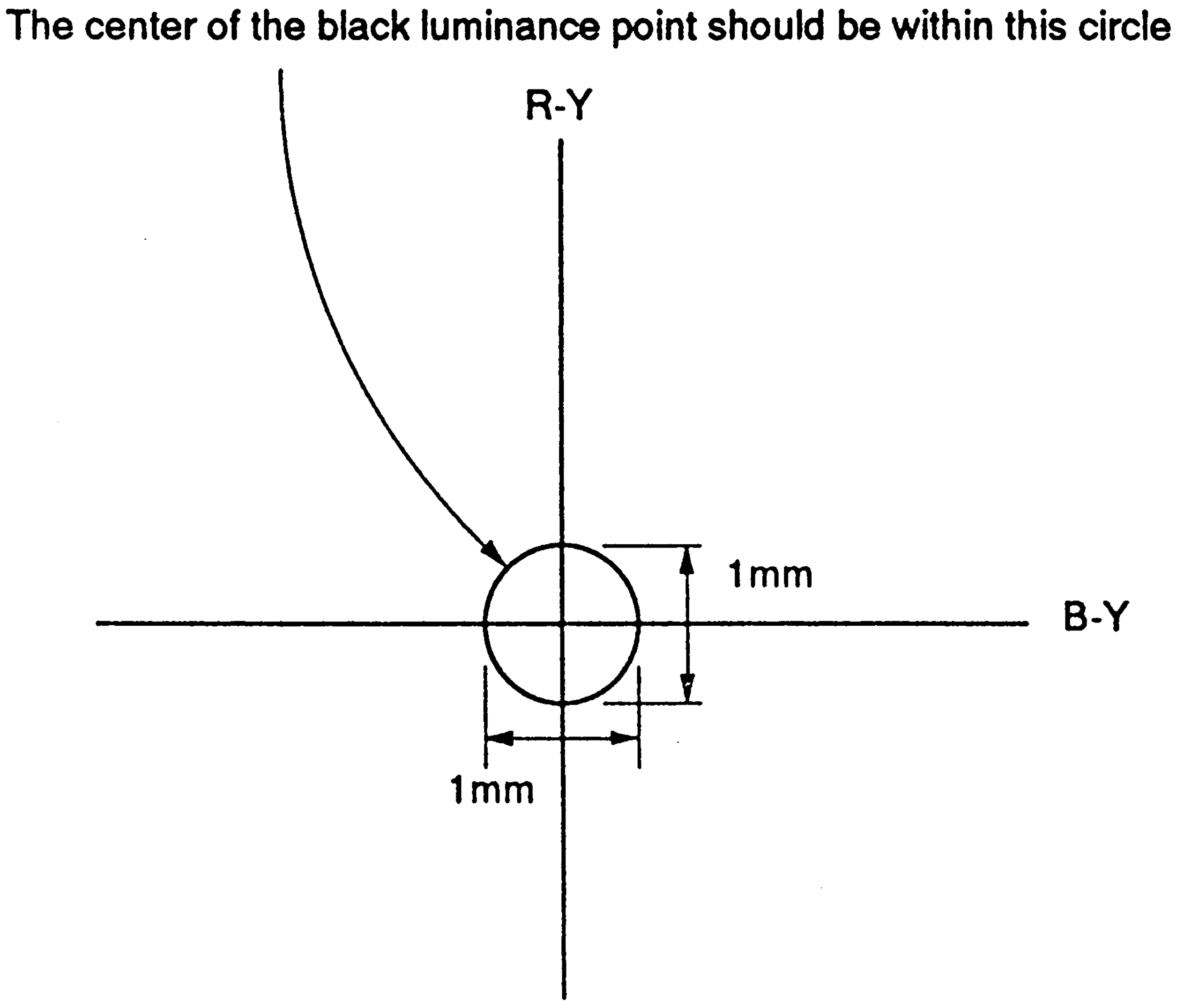

The center of the black luminance point should be within this circle
R-Y
1mm
B-Y
1mm

Fig. 7-10.

15. Picture Frame Setting

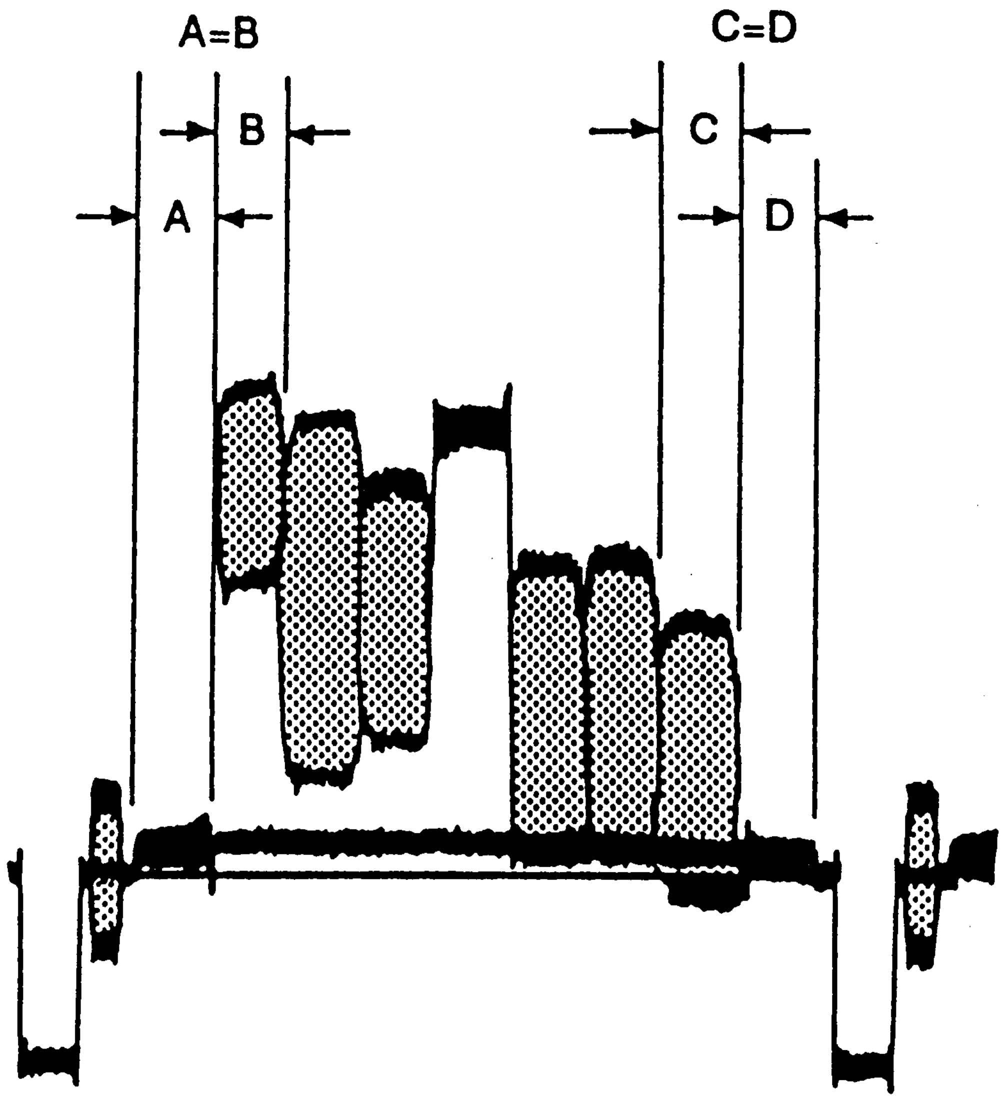
Subject	Color bar chart standard picture frame
Measurement Point	Video output terminal
Measuring Instrument	Oscilloscope and TV monitor.
Specified Value	A=B, C=D, t=0 ± 0.1 msec

Setting method:

1) Turn the auto focus off.
2) Adjust the focus using the focus ring.
3) Adjust the zoom and the camera direction, and set to the specified position.
4) Mark the position of the picture frame on the monitor display, and adjust the picture frame to this position in following adjustments using "color bar chart standard picture frame" and "white pattern standard picture frame".

Check on the oscilloscope

1. horizontal period



2. Vertical period

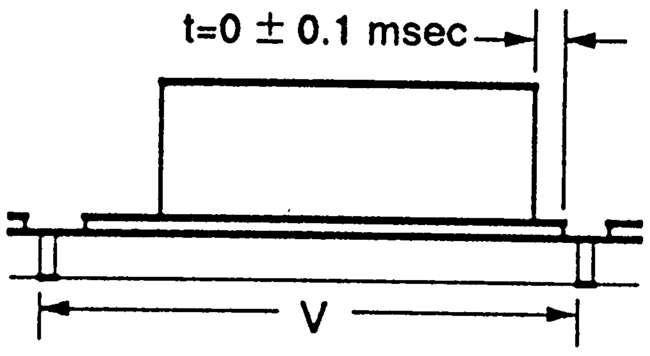


Fig. 7-11.

Check on the TV monitor

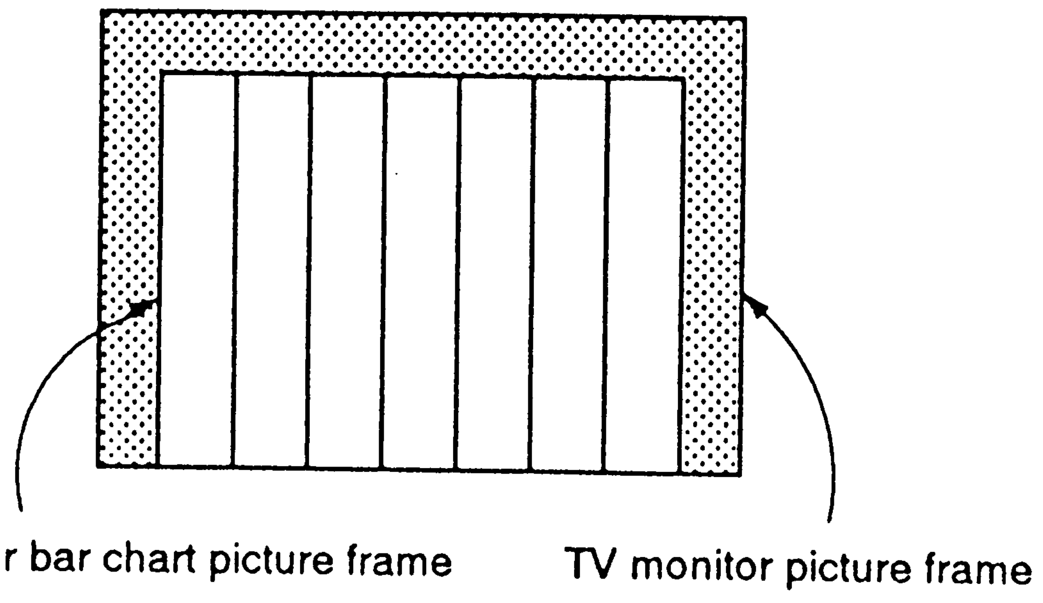


Fig. 7-12.

16. IRIS Level Adjustment (CS-44 board)

Subject	Color bar standard picture frame
Measurement Point	Pin ⑪ of CN701 (IRIS OUT)
Measuring Instrument	Oscilloscope
Adjustment Page	F
Adjustment Address	63 (AGC MIN)
Specified Value	A=230 ± 5 mV

Adjusting method:

1) Release the protect.
   Page: 6, address: 00, data: 01
2) Change the data of page: F, address: 63, and adjust so that the IRIS OUT signal level (A) becomes the specified value.
3) Press the PAUSE button of the adjusting remote control unit.

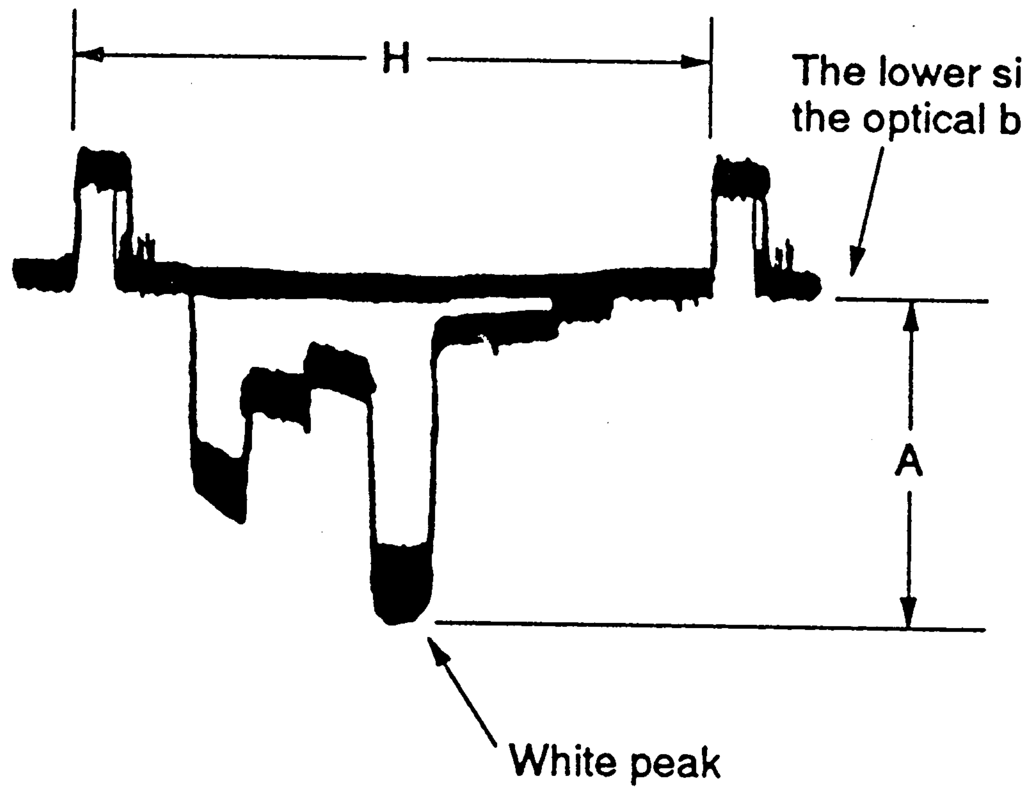


Fig. 7-13.

17. MAX GAIN Adjustment (CS-44 board)

Subject	Color bar standard picture frame
Filter	ND filter 1.0 (2 sheets) and 0.4 (1 sheet), 0.1 (1 sheet)
Measurement Point	Pin ⑱ of CN701 (CAM Y)
Measuring Instrument	Oscilloscope
Adjustment Page	F
Adjustment Address	64 (AE MIN L)
Specified Value	A=210 ± 5mV

Adjusting method:
1) Place the ND filter 2.5 (1.0+1.0+0.4+0.1) on the lens.
2) Release the protect.
   Page: 6, address: 00, data: 01
2) Change the data of page: F, address: 64, and adjust so that the CAM Y signal level (A) becomes the specified value.
4) Press the PAUSE button of the adjusting remote control unit.

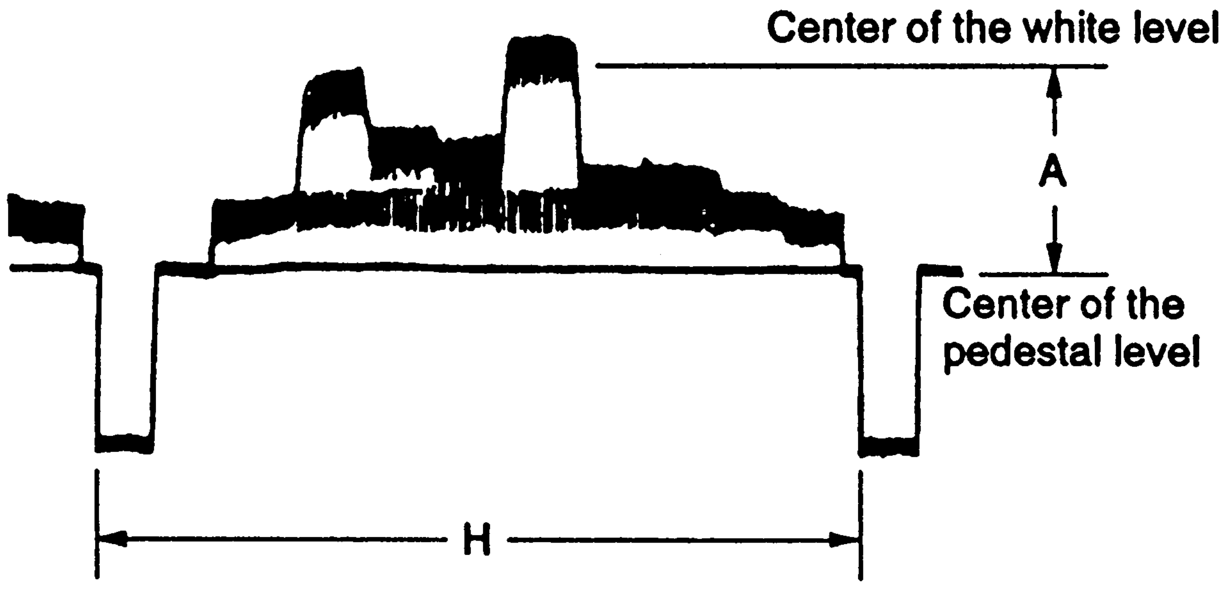


Fig. 7-14.

18. IRIS IN/OUT Adjustment

Subject	White pattern standard picture frame
Measurement Point	DDS display of the EVF or TV monitor
Measuring Instrument	
Adjustment Page	F
Adjustment Address	39 (AWB IRIS IN) 3A (AWB IRIS OUT)

Adjusting method:
1) Set data: 11 to page: 6, address: 00.
   (Camera adjustment mode (Window ON) setting)
2) Set data: 22 to page: F, address: AE, and press the PAUSE button of the adjusting remote control unit.
3) Set data: 40 to page: F, address: AF, and press the PAUSE button of the adjusting remote control unit.
   (HALL data display)
4) Set data: 0B to page: 6, address: 01, and press the PAUSE button of the adjusting remote control unit.
   (ND0.8 shutter mode setting)
5) Read the DDS display data (the bottom two digits of the display data at the bottom right of the EVF or the TV monitor), and set to D39.
6) Set data: D39 to page: F, address: 39, and press the PAUSE button of the adjusting remote control unit.
7) Set data: 09 to page 6, address: 01, and press the PAUSE button of the adjusting remote control unit.
   (ND0.5 shutter mode setting)
8) Read the DDS display data and set to D3A.
9) Set data: D3A to page: F, address: 3A, and press the PAUSE button of the adjusting remote control unit.

Processing after completing adjustments
1) Set data: 24 to page: F, address: AE, and press the PAUSE button of the adjusting remote control unit.
2) Set data: 00 to page: 6, address: 01, and press the PAUSE button of the adjusting remote control unit.
   (Release of the ND0.8 shutter mode)

19. Pre-white Balance Adjustment

Subject	White pattern standard picture frame
Measurement Point	Video output terminal
Measuring Instrument	Vectorscope
Adjustment Page	F
Adjustment Address	33 (R CONT REF), 34 (B CONT REF)
Specified Value	The center of the white luminance point should lie within the circle with a diameter of 1mm and whose center is the principle point

Adjusting method:

1) Set data: 0F to page: 6, address: 01, and press the PAUSE button of the adjusting remote control unit.
   (WB 3200K preset mode setting)
2) Set data: 11 to page: 6, address: 00.
   (Camera adjustment mode (Window ON) setting)
3) Change the data of addresses:33 and 34 of page: F alternately, and coincide the white luminance point to the principle point.
   Note: Be sure to press the PAUSE button of the adjusting remote control unit before changing the addresses.
   If not, the new data will not written to the memory.
4) Press the PAUSE button of the adjusting remote control unit.

Processing after completing adjustments

1) Set data: 00 to page: 6, address: 01, and press the PAUSE button of the adjusting remote control unit.
   (Release of the preset mode)
2) Set data: 10 to page: 6, address: 00.
   (Protect mode setting)

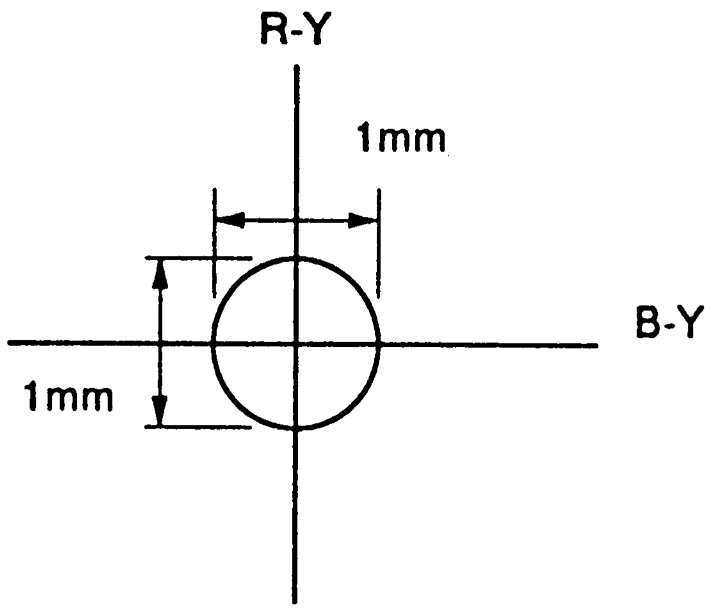


Fig. 7-15.

20. Color Reproduction Adjustment

Subject	Color bar chart standard picture frame
Measurement Point	Video output terminal
Measuring Instrument	Vectorscope
Adjustment Page	F
Adjustment Address	18 (CORE B–Y GAIN), 19 (CORE R–Y GAIN), 1A (CORE R–Y HUE), 1B (CORE B–Y HUE)
Specified Value	All color luminance points should settle within each color reproduction frame.

Adjusting method:

1) Set data: 0F to page: 6, address: 01, and press the PAUSE button of the adjusting remote control unit.
   (Indoor white balance mode setting)
2) Set data: 01 to page: 6, address: 00.
   (Camera adjustment mode (Window OFF) setting)
3) Adjust the GAIN and PHASE of the vectorscope, and adjust the burst luminance point to the burst position of the color reproduction frame.
4) Change the data of addresses 18 to 1B of page: F, and settle each color luminance point in each color reproduction frame.
   Note: Be sure to press the PAUSE button of the adjusting remote control unit before changing the addresses.
   If not, the new data will not be written to the memory.
5) Press the PAUSE button of the adjusting remote control unit.

Processing after completing adjustments

1) Set data: 00 to page: 6, address: 01.
   (Release of the adjustment mode)
2) Set data: 10 to page: 6, address: 00.
   (Protect mode setting)

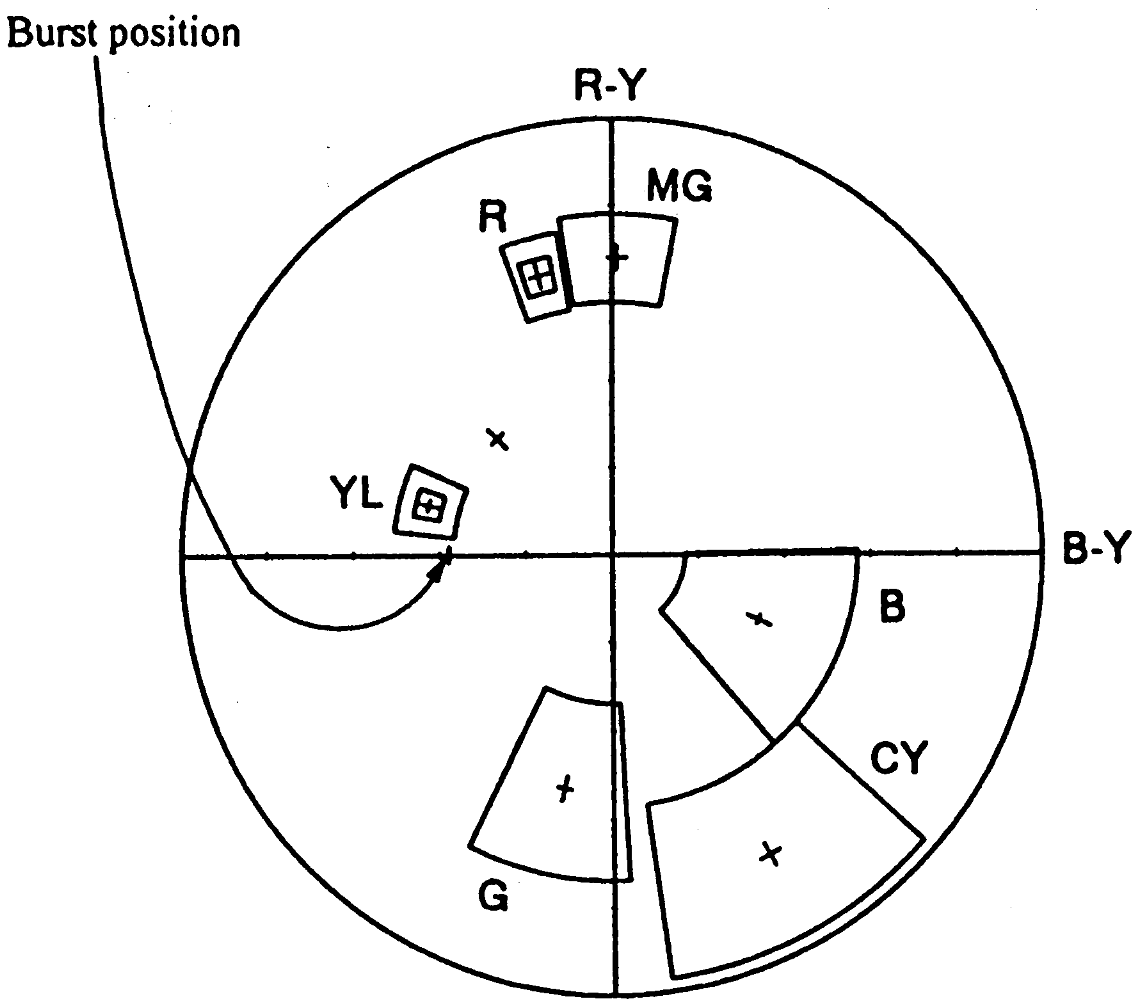


Fig. 7-16.

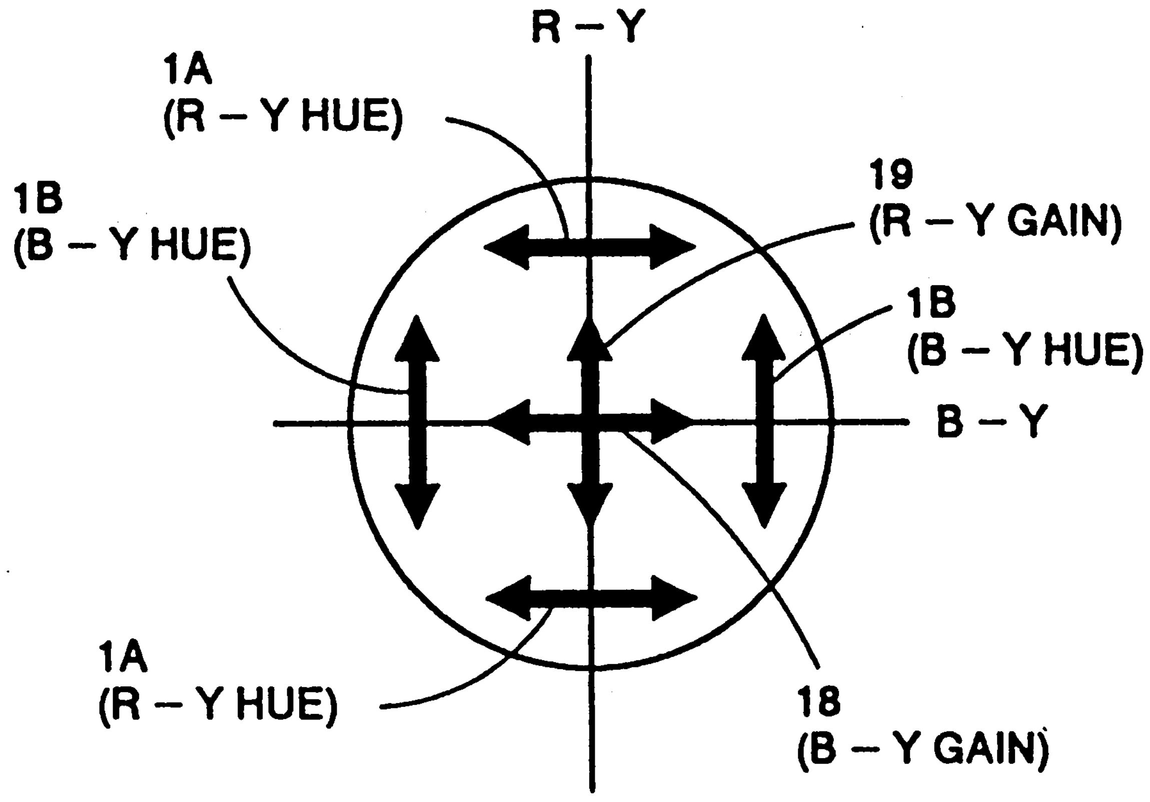


Fig. 7-17. Direction of the Movements of the Adjustment Address and Luminance Point

21. Auto White Balance Preset Adjustment

Subject	White pattern standard picture frame
Adjustment Page	F
Adjustment Address	2D (R REF L), 2E (R REF H), 2F (G REF L), 30 (G REF H), 31 (B REF L), 32 (B REF H)

Adjusting method:

1) Turn the power of the unit OFF/ON.
2) Check that the data of page: 6, address: 09 is 00.
   (Auto white balance preset adjustment possible display)
3) Set data: 11 to page: 6, address: 00.
   (Camera adjustment mode (Window ON) setting)
5) Set data: 11 to page: 6, address: 01, and press the PAUSE button of the adjusting remote control unit.
   (3200K preset data take in preparation mode)
6) Set data: 0D to page: 6, address: 01, and press the PAUSE button of the adjusting remote control unit.
   (When the 3200K preset data is taken in, the data will be automatically input to addresses 2D to 32 of page F.)
7) Check that the data of page: 6, address: 09 is 01.
   (Auto white balance preset adjustment completion display)

Processing after completing adjustments

1) Set data: 00 to page: 6, address: 01, and press the PAUSE button of the adjusting remote control unit.
   (Release of the auto white balance preset mode)
2) Set data: 10 to page: 6, address: 00.
   (Release of camera adjustment mode)

22. Auto White Balance Adjuatment

Subject	White pattern standard picture frame
Filter	Filter C14 for color temperature correction
Measurement Point	Check with the DDS display on the EVF or TV monitor
Measuring Instrument	
Adjustment Page	F
Adjustment Address	35 (AWB NORM R) 36 (AWB NORM B)
Specified Value	R ratio 2A80 ± 40 B ratio 5E80 ± 40

Note: Check that "Auto white balance preset adjustment" has been completed.

Adjusting method:

1) Set data: 11 to page: 6, address: 00.
   (Camera adjustment mode (Window ON) setting)
2) Set data: D0 to page: F, address: 60, and press the PAUSE button of the adjusting remote control unit.
   (Auto white balance adjustment mode setting)
3) Set data: 82 to page: F, address: AF.
   (R ratio display mode setting)
4) Change the data of page: F, address: 35, and adjust the average value of the DDS display data (the display data at the bottom right of the EVF or the TV monitor) to 2980 ± 40.
5) Press the PAUSE button of the adjusting remote control unit.
6) Set data: 83 to page: F, address: AF.
   (B ratio display mode setting)
7) Change the data of page: F, address: 36, and adjust the average value of the DDS display data to 5C80 ± 40.
8) Press the PAUSE button of the adjusting remote control unit.

Processing after completing adjustments

1) Set data: 00 to page: F, address: 60, and press the PAUSE button of the adjusting remote control unit.
   (Release of the white balance adjustment mode)
2) Set data: 10 to page: 6, address: 00.
   (Release of camera adjustment mode)

23. White Balance Check

Subject	White pattern standard picture frame
Filter	Filter C14 for color temperature correction ND filter 1.0 and 0.3
Measurement Point	Video output terminal
Measuring Instrument	Vectorscope
Specified Value	Fig. 7-18. A to C

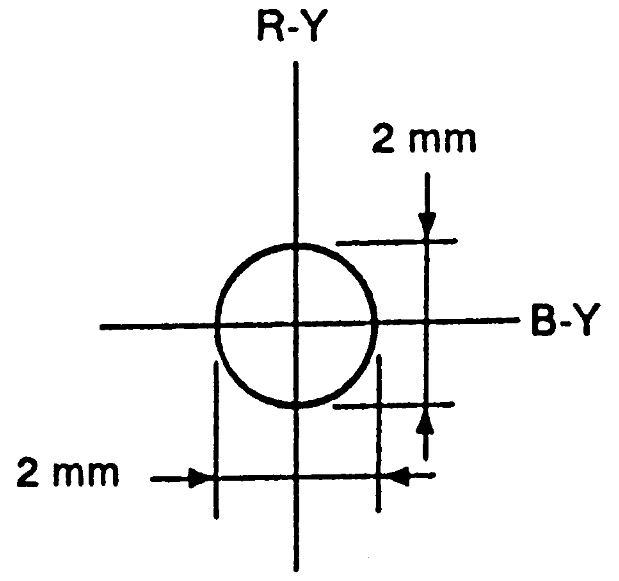


Fig. 7-18. A

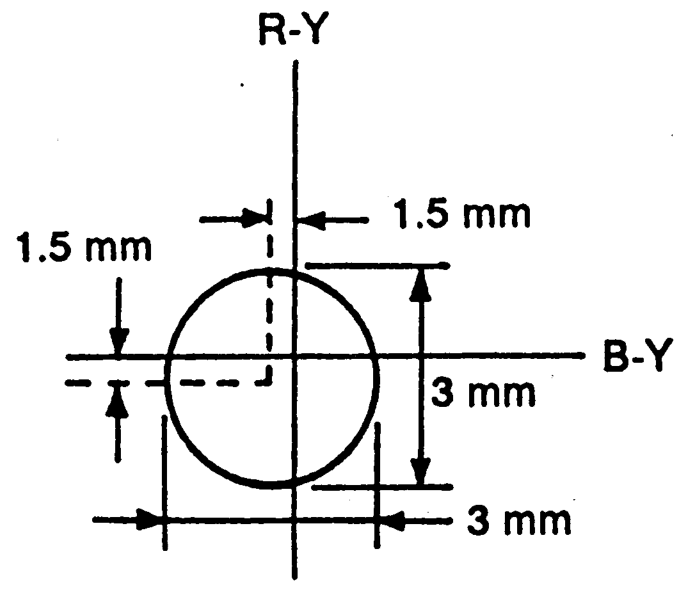


Fig. 7-18. B

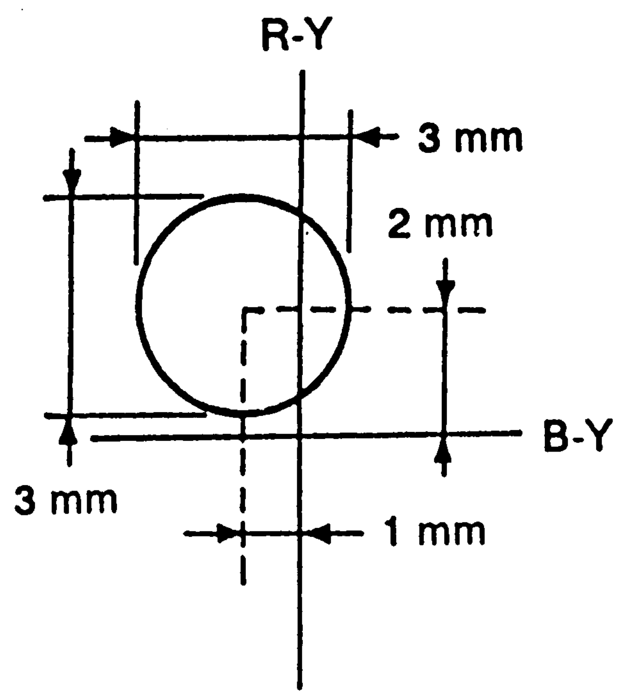


Fig. 7-18. C

Checking method:

1) Check that the lens is not covered with either filter.
2) Set data: 11 to page: 6, address: 00.
   (Camera adjustment mode (Window ON) setting)
3) Set data: 0F to page: 6, address: 01, and press the PAUSE button of the adjusting remote control unit.
   (Indoor white balance mode setting)
4) Check that the center of the white luminance point is within the circle shown in Fig. 7-18.A.
   (Indoor white balance check)
5) Set data: 00 to page: 6, address: 01, and press the PAUSE button of the adjusting remote control unit.
   (Auto white balance mode setting)
6) Set data: 01 to page: F, address: 5C, and press the PAUSE button of the adjusting remote control unit.
   (Auto white balance high speed tracking mode setting)
7) Set data: 91 to page: F, address: AF, and press the PAUSE button of the adjusting remote control unit.
   (R, B ratio (M) display mode setting)
8) Check that the top 2 digits and the bottom 2 digits of the DDS display are 3D to 43.
9) Check that the center of the white luminance point is within the circle shown in Fig. 7-18. A.
10) Place the C14 filter on the lens.
11) Check that the center of the white luminance point settles in the circle shown in Fig. 7-18. B.
    (Auto white balance outdoor mode check)
12) Remove the C14 filter, and place the ND filter 1.3 (1.0+0.3) on the lens.
13) Check that the center of the white luminance point settles in the circle shown in Fig. 7-18. C.
    (Auto white balance outdoor mode check)

Processing after completing adjustments

1) Set data: 0E to page: F, address: 5C, and press the PAUSE button of the adjusting remote control unit.
   (Release of the auto white balance fast tracking mode)
2) Set data: 00 to page: F, address: AF, and press the PAUSE button of the adjusting remote control unit.
   (Release of the R, B ratio (M) display mode)
3) Set data: 10 to page: 6, address: 00.
   (Release of camera adjustment mode)

24. Linear Matrix Adjustment

Subject	Color bar standard picture frame
Filter	Filter C14 for color temperature correction
Measurement Point	DDS display on the EVF or TV monitor
Measuring Instrument	
Adjustment Page	F
Adjustment Address	3D (DMAT HUE) 3E (DMAT GAIN)

Note 1: Check that position that was set in the color bar chart picture frame "15. Picture Frame Setting" is maintained, before beginning adjustments.

Adjusting method:

1) Remove the filter C14 for color temperature correction.
2) Release the protect.
   Page: 6, address: 00, data: 01
3) Color bar data sampling mode setting
   1. Check that the data of page: 6, address: 01 is 00.
   2. Set data: F1 to page: F, address: 60, and press the PAUSE button of the adjusting remote control unit.
   3. Set data: 2E to page: F, address: 14, and press the PAUSE button of the adjusting remote control unit.
   (Check that the colors on the monitor display at the color modulation stop mode have disappeared)
4) Specifying the Yellow position
   1. Set data: C9 to page: 1, address: E6.
   2. Set data: B6 to page: 1, address: E7.
5) Set data: 03 to page: F, address: AF, and press the PAUSE button of the adjusting remote control unit.
   (R–Y•B–Y data display mode setting)
6) Read the average value of the DDS display data (Note 2), and set to Y_1.
7) Specifying the Red position
   1. Set data: 59 to page: 1, address: E6.
   2. Set data: 6D to page: 1, address: E7.
8) Read the average value of the DDS display data (Note 3), and set to R_1.
9) Place the filter C14 for color temperature correction on the lens. (Ensure that the picture frame of the chart does not shift at this time.)
10) Specifying the yellow position.
    1. Set data: C9 to page: 1, address: E6.
    2. Set data: 8F to page: 1, address: E7.
11) Read the average value of the DDS display data (Note 2), and set to Y_2.
12) Convert Y_1, R_1, Y_2 to decimal notation to obtain Y_1', R_1' and Y_2'.
    (Refer to Table 7-6. "Hexadecimal notation-decimal notation conversion table")
13) Calculate X_1' from the following equation (decimal notation calculation).
    $X_1'=Y_2'-Y_1'$
14) Calculate D3D from the following table
    (D3D is hexadecimal notation)

X_1' value	D3D
$-1 \leqq X_1' \leqq 1$	F0
$X_1'>1$	F1
$X_1'<-1$	FF

15) Set data: D3D to page: F, address: 3D, and press the PAUSE button of the adjusting remote control unit.
16) Specifying the Red position
    1. Set data: 59 to page: 1, address: E6.
    2. Set data: 6D to page: 1, address: E7.
17) Read the average value of the DDS display data (Note 3), and set to R_2.
18) Convert R_2 to decimal notation to obtain R_2'.
19) Calculate X_2' from the following equation (decimal notation calculation).
    $X_2'=R_2'-R_1'$
20) Calculate D3E from the following table.

X_2' value	D3E
$X_2' \geqq 0$	00
$0>X_2' \geqq -1$	01
$-1>X_2'$	02

21) Set data: D3E to page: F, address: 3E, and press the PAUSE button of the adjusting remote control unit.

Processing after completing adjustments

1) Set data: 00 to page: F, address: 60, and press the PAUSE button of the adjusting remote control unit.
   (Release of the sampling mode)
2) Set data: 2C to page: F, address: 14, and press the PAUSE button of the adjusting remote control unit.
   (Color modulation ON mode setting)
3) Set data: 00 to page: F, address: AF, and press the PAUSE button of the adjusting remote control unit.
   (Release of the R–Y•B–Y data display mode)
4) Turn the main power supply (6.3V) off.

Note 2: The right two digit of the display data at the bottom right of the EVF or monitor TV.

Note 3: The left two digit of the display data at the bottom right of the EVF or monitor TV.

25. Title Color Reporduction Adjustment

Subject	All black (Cover the lens with a black cap)
Measurement Point	Video output terminal
Measuring Instrument	Vectorscope
Adjustment Page	D
Adjustment Address	14 (BLU R–Y), 15 (BLU B–Y), 16 (GRN R–Y), 17 (GRN B–Y), 18 (CYN R–Y), 19 (CYN B–Y), 1A (RED R–Y), 1B (RED B–Y), 1C (VIO R–Y), 1D (VIO B–Y), 1E (YEL R–Y), 1F (YEL B–Y)
Specified Value	Each title color luminance point should settle within each color reproduction frame.

Note: For details on the page D address list, refer to "Service mode" in "Video Section Adjustments".

Adjusting method:

1) Release the protect of page D.
   Page: 1, address: 00, data: 01
2) Press the superimpose button "memory".
3) Use the "color/mode" button to change the title color to "blue".
4) Change the data of addresses 14 and 15 of page D, and and settle the blue luminance points within the blue (B) color reproduction frame.
5) Select page: D, address: 14, and press the PAUSE button of the adjusting remote control unit.
6) Select page: D, address: 15, and press the PAUSE button of the adjusting remote control unit.
7) Adjust for green (addresses 16, 17), cyan (addresses 18, 19), red (addresses 1A, 1B), violet (addresses 1C, 1D) and yellow (addresses 1E, 1F) in the same way.

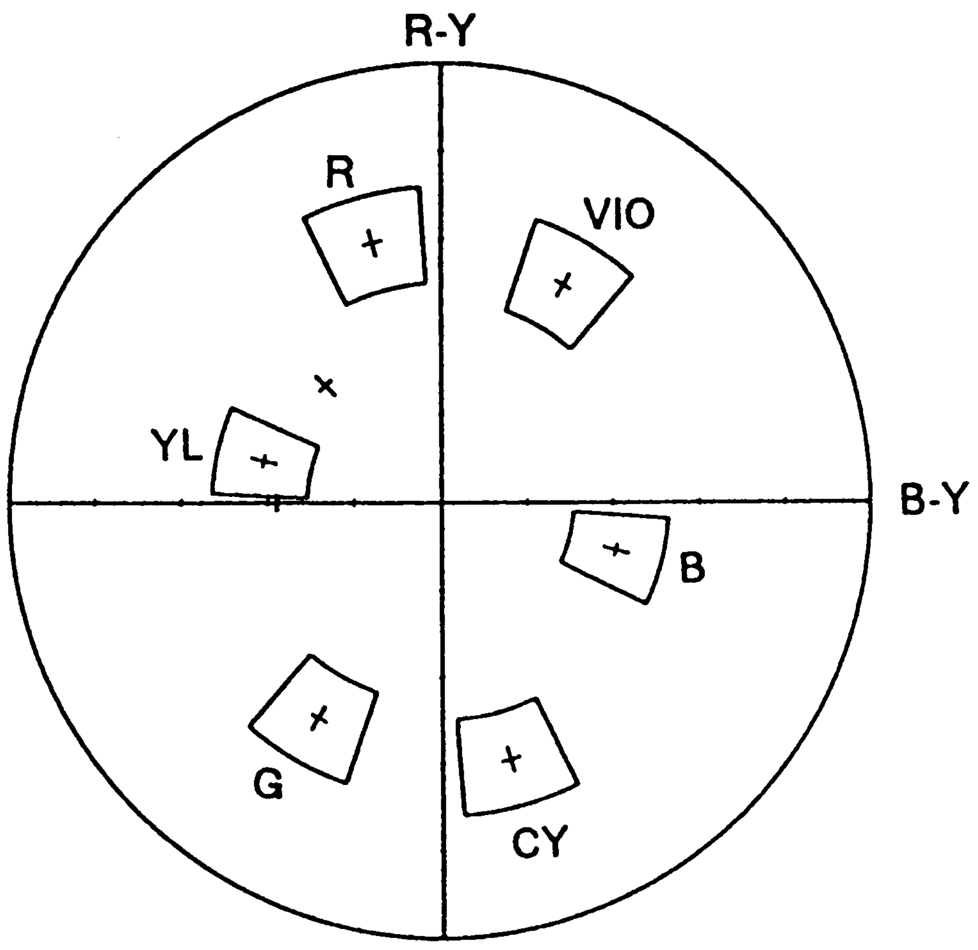


Fig. 7-19.

26. VIDEO OUT Level Check

Subject	Color bar chart standard picture frame
Measurement Point	Video output terminal (Terminated at 75 Ω)
Measuring Instrument	Oscilloscope
Specified Value	Y level=690 ± 40 mV SYNC level=285 ± 20 mV BURST level=285 ± 30 mV

Checking method:

1) Check that the Y level, SYNC level and BURST level satisfy the specified values.

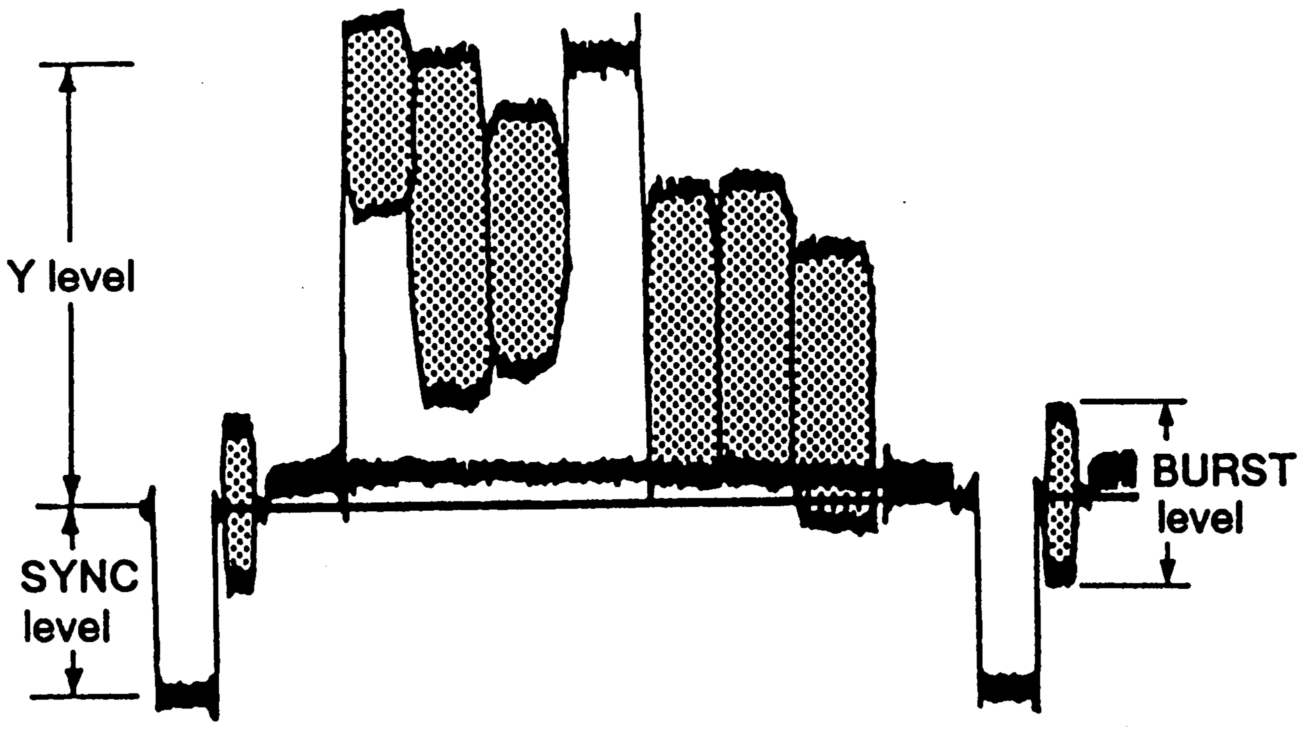


Fig. 7-20.

7-3. ELECTRONIC VIEWFINDER SYSTEM ADJUSTMENT (VF-44 BOARD)

7-3-1. Horizontal Tilt Adjustment

Mode	Playback
Signal	Alignment tape for checking operation (WR5-5NSP) Monoscope portion
Specified Value	See Fig. 7-22.

Adjustment method:

1) Adjust RV503 (BRIGHT) for appropriate brightness on CRT screen.
2) Loosen the DY (deflection yoke) tightening nut. (See Fig. 7-21.)
3) Make a picture horizontal by turning the DY.
4) Retighten the nut. (Do not tighten excessively.)

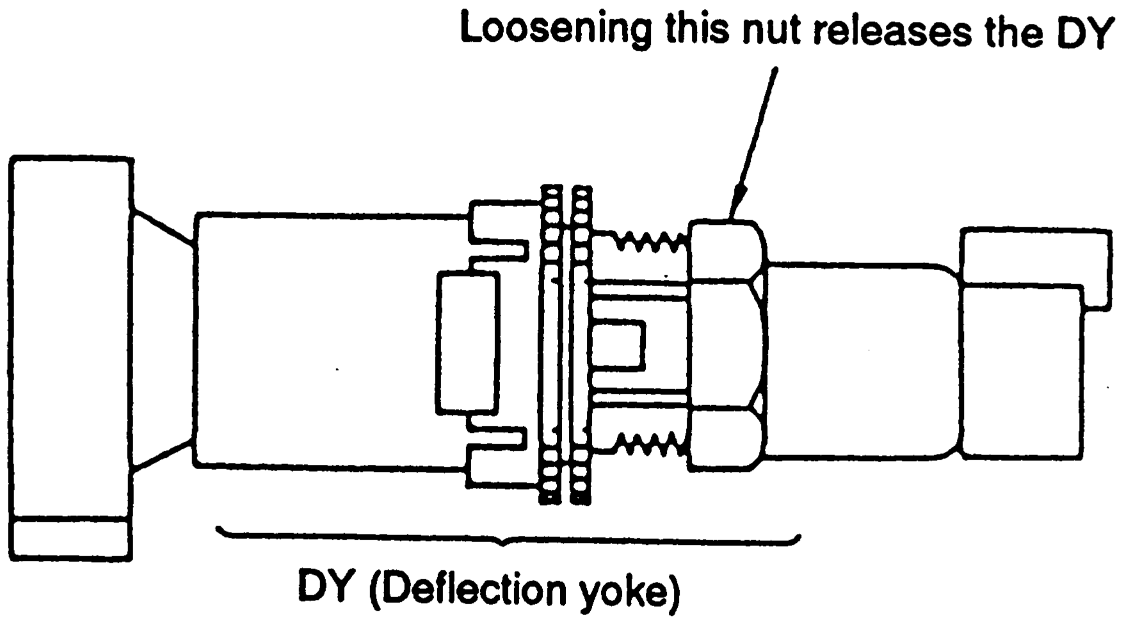
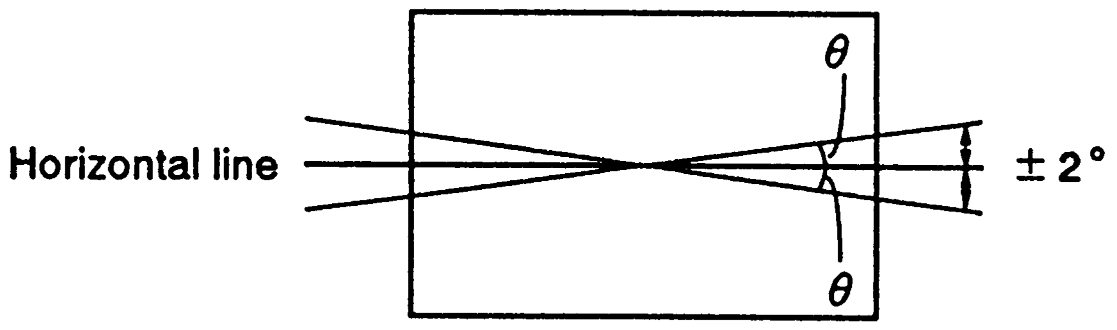


Fig. 7-21.



Specified value: Image orientation within ± 2° of horizontal line.

Fig. 7-22.

7-3-2. Centering Adjustment

Mode	Playback
Signal	Alignment tape for checking operation (WR5-5NSP) Monoscope portion
Specified Value	See Fig. 7-24.

Adjustment method:

1) Turn the centering adjustment rings to provide an image with even right, left, upper and lower margins. (See Fig. 7-23.)

Note: Since the centering position is affected by the earth magnetism, turn the equipment over 360° horizontally, and make adjustments at the orientation which exhibits median displacements of the image.

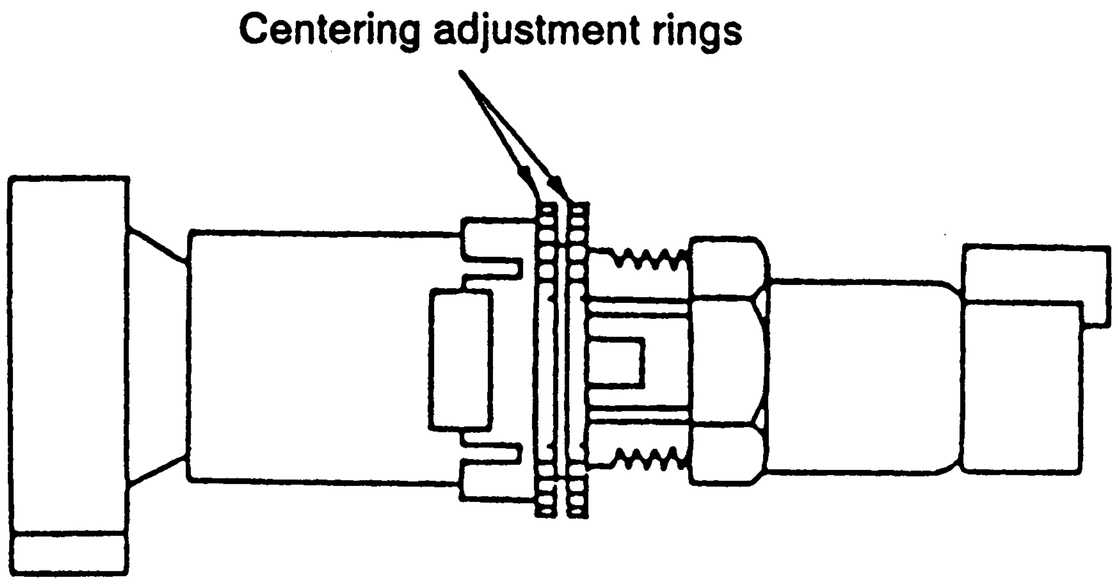
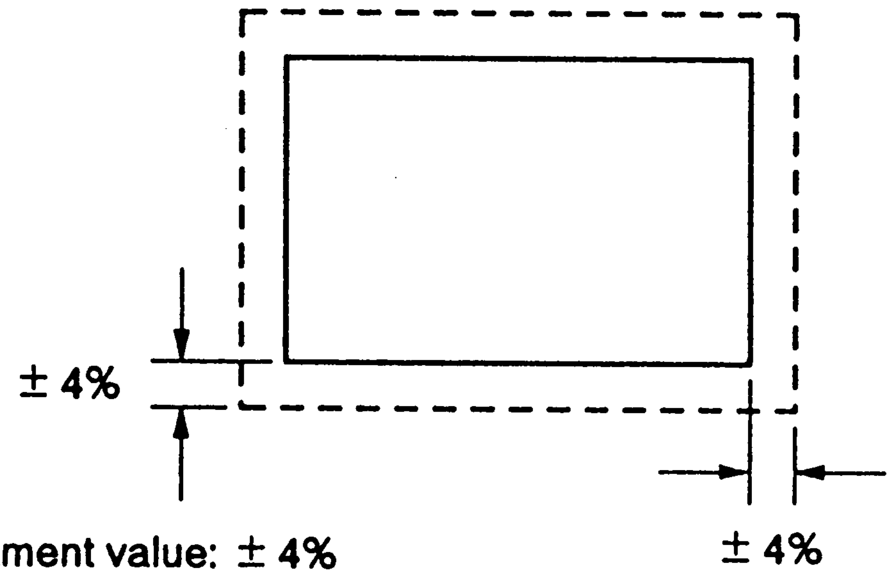


Fig. 7-23.



Adjustment value: ± 4%

Fig. 7-24.

7-3-3. AFC Adjustment (VF-44 Board)

Mode	E-E or Camera standby
Signal	Color bar
Measurement Point	C517 ⊕ side
Measuring Instrument	Digital voltmeter or oscilloscope (DC range)
Adjustment Element	RV504 (AFC)
Specified Value	2.60 ± 0.05 Vdc

Adjustment method:

1) Adjust RV504 (AFC) for 2.60 ± 0.05 Vdc.

7-3-4. Horizontal Amplitude Adjustment (VF-44 Board)

Mode	Playback
Signal	Alignment tape for checking operation (WR5-5NSP) Monoscope portion
Adjustment Element	C504
Specified Value	6 ± 3%

Adjustment method:

1) Line up the upper and lower sections of the monoscope image with the upper and lower edges of the screen by RV505 (V SIZE).
2) Rotate RV503 (BRIGHT) to set the brightness to the normal level.
3) Short or open the pattern A of the H size adjustment capacitor (C504) to provide horizontal overscans of 6 ± 3% (total of left and right). (See Fig. 7-26.)

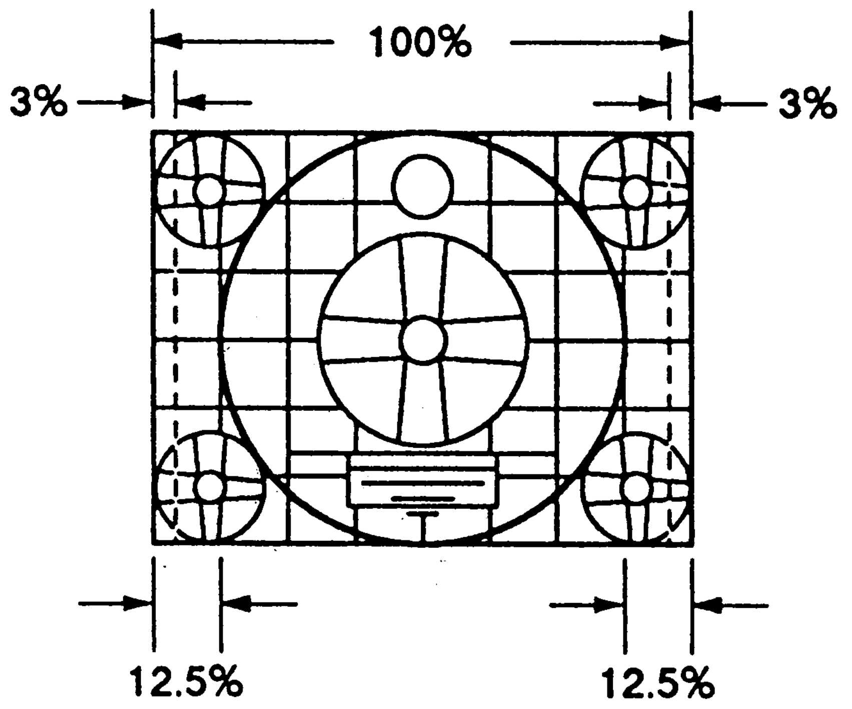
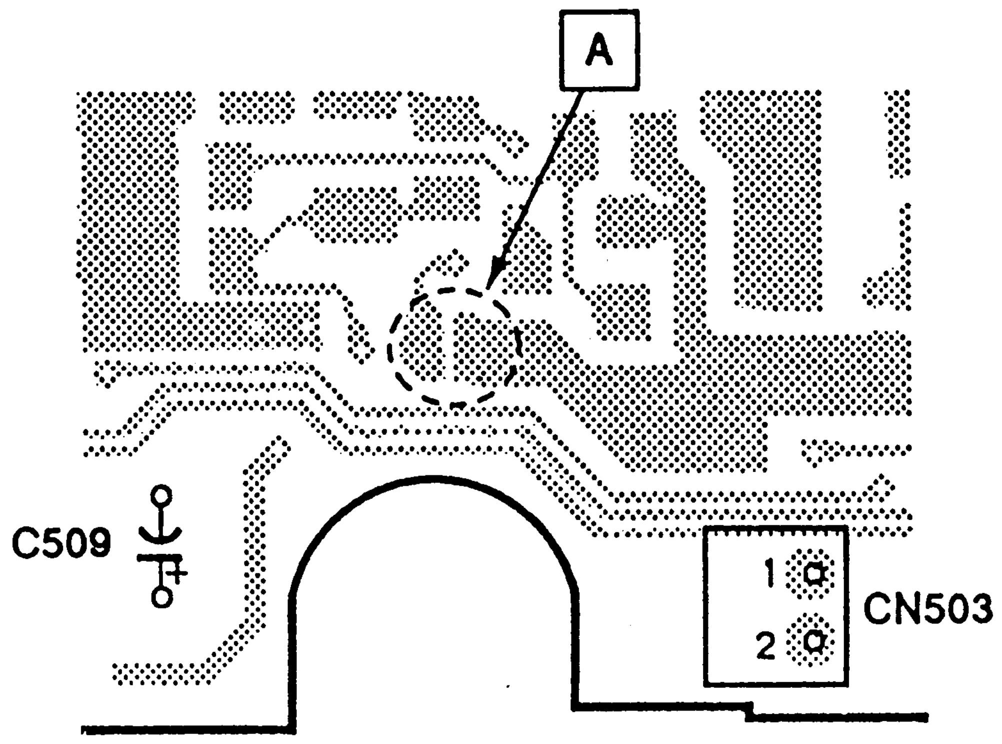


Fig. 7-25.



A section	H size
Short	Large
Open	Small

Fig. 7-26.

7-3-5. Vertical Amplitude Adjustment (VF-44 Board)

Mode	Playback
Signal	Alignment tape for checking operation (WR5-5NSP) Monoscope portion
Adjustment Element	RV505 (V SIZE)
Specified Value	5 ± 3%

Adjustment method:

1) By turning RV505 (V SIZE), adjust vertical overscan to 5 ± 3% (upper and lower total).

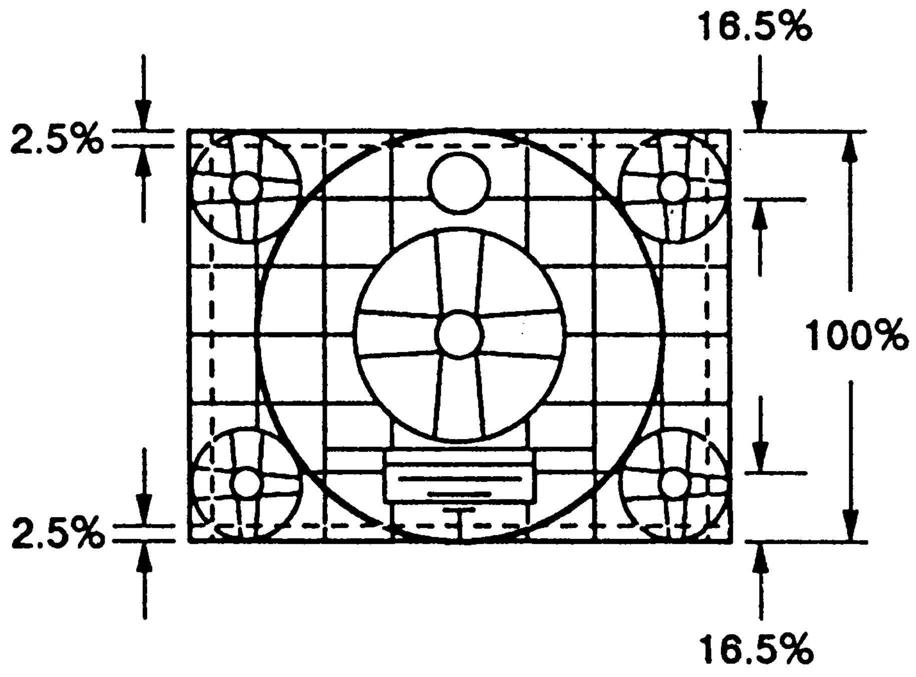


Fig. 7-27.

7-3-6. Forcus Adjustment (VF-44 Board)

Mode	Playback
Signal	Alignment tape for checking operation (WR5-5NSP) Monoscope portion
Adjustment Element	RV502 (FOCUS)

Adjustment method:

1) Adjust to the best focus point with RV502.

7-3-7. Brightness, Contrast Adjustments (VF-44 Board)

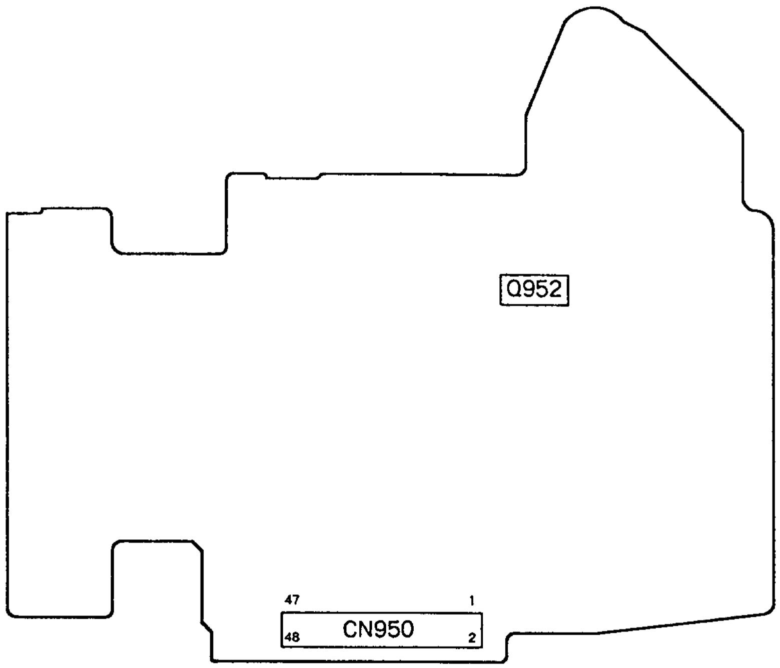
Mode	Playback
Signal	Alignment tape for checking operation (WR5-5NSP) Monoscope portion
Adjustment Element	Brightness: RV503 (BRIGHT) Contrast: RV501 (CONT)

Adjustment method:

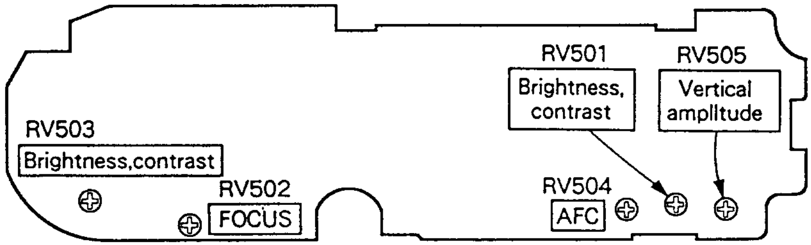
1) Adjust RV503 (BRIGHT) and RV501 (CONT) alternately until the bright and dark areas of a gray scale are displayed correctly. (The bright areas should not be made too bright to avoid a fuzzy display of the cross-hatches in the monoscope circle, and the brightness of the dark areas should be such that discrimination between the darkest and second darkest area is possible.)

7-4. ARRANGEMENT DIAGRAM FOR ADJUSTMENT PARTS

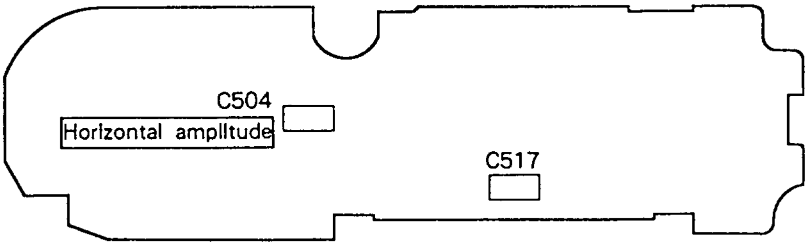
PS-312 BOARD(COMPONENT SIDE)


Q952
47
1
48
CN950
2

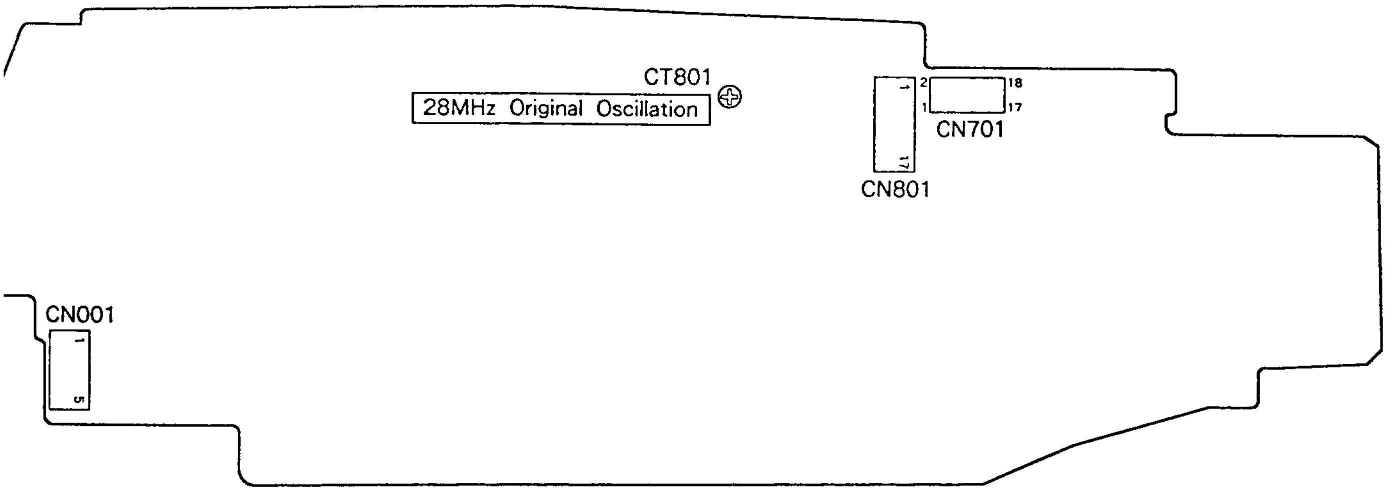
VF-44 BOARD(COMPONENT SIDE)


RV501
Brightness, contrast
RV505
Vertical amplitude
RV503
Brightness,contrast
RV502
FOCUS
RV504
AFC

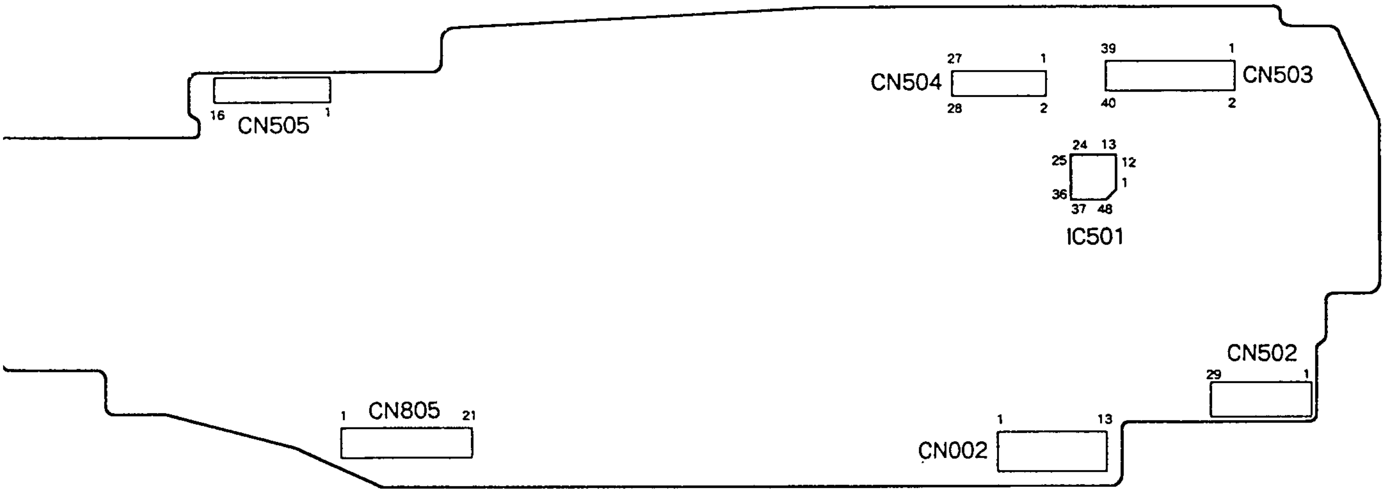
VF-44 BOARD(CONDUCTOR SIDE)


C504
Horizontal amplitude
C517

S-44 BOARD(COMPONENT SIDE)


CT801
28MHz Original Oscillation
CN701
2
1
18
17
CN801
1
17
CN001
1
5

S-44 BOARD(CONDUCTOR SIDE)


CN505
16
1
CN504
27
1
28
2
39
1
CN503
40
2
24
13
25
12
1
36
37
48
IC501
CN502
29
1
1
CN805
21
1
13
CN002

SECTION 8

MECHANICAL SECTION ADJUSTMENTS

For Mechanical Adjustments

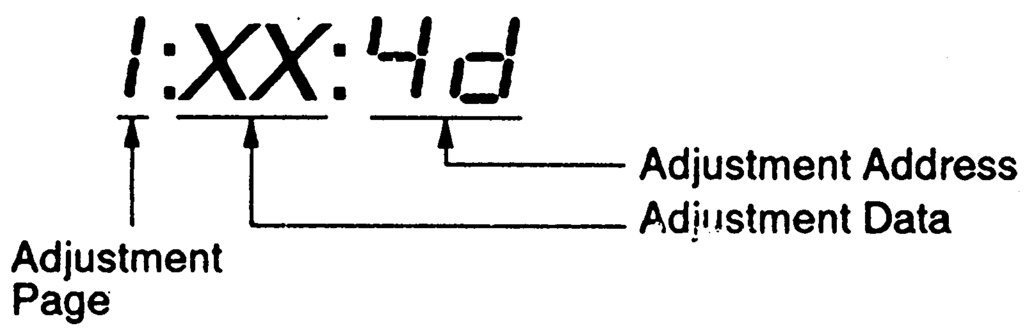
Refer to the separate volume of mechanical adjustment “8 mm Video MECHANICAL ADJUSTMENT MANUAL Ⅳ (A Mechanism)” for the adjustments and checks of mechanism section and the mechanical parts replacement. (9-973-199-11)
For setting of the track shift mode, however, refer to the following.

8-1. SETTING THE TRACK SHIFT MODE

Note: Camera part and video part should have been installed.

[Setting Method]

1) Set the adjustment commander to the HOLD ON side.
2) Set page: 1, address: 01 and data: 01, and then release the protector.
3) Set page: D and address: 01.
4) Set adjustment data to 03 (test mode 3) by PLAY or STOP button.
   (When HOLD OFF once after the setting and HOLD ON again, the display of the address data will be changed. To set the another mode with shifting, repeat the procedures from 3).)
5) Set to the HOLD OFF side in order to set the normal mode.



8-2. PREPARATION FOR ADJUSTMENT

1) Clean the tape running surfaces (tape guides, drum, capstan shaft, pinch roller.)
2) Connect to the oscilloscope.
   CH1: CS-44 board CN001 pin ③ (PB RF)
   CH2: CS-44 board CN001 pin ④ (SWP)
3) Play back the tracking alignment tape (WR5-1NP: 8-967-995-02).
4) Check that the RF waveform of the oscilloscope is flat at both inlet and outlet sides. If not flat, make adjustment as follows. (Refer to Fig. 8-1 and 8-2)

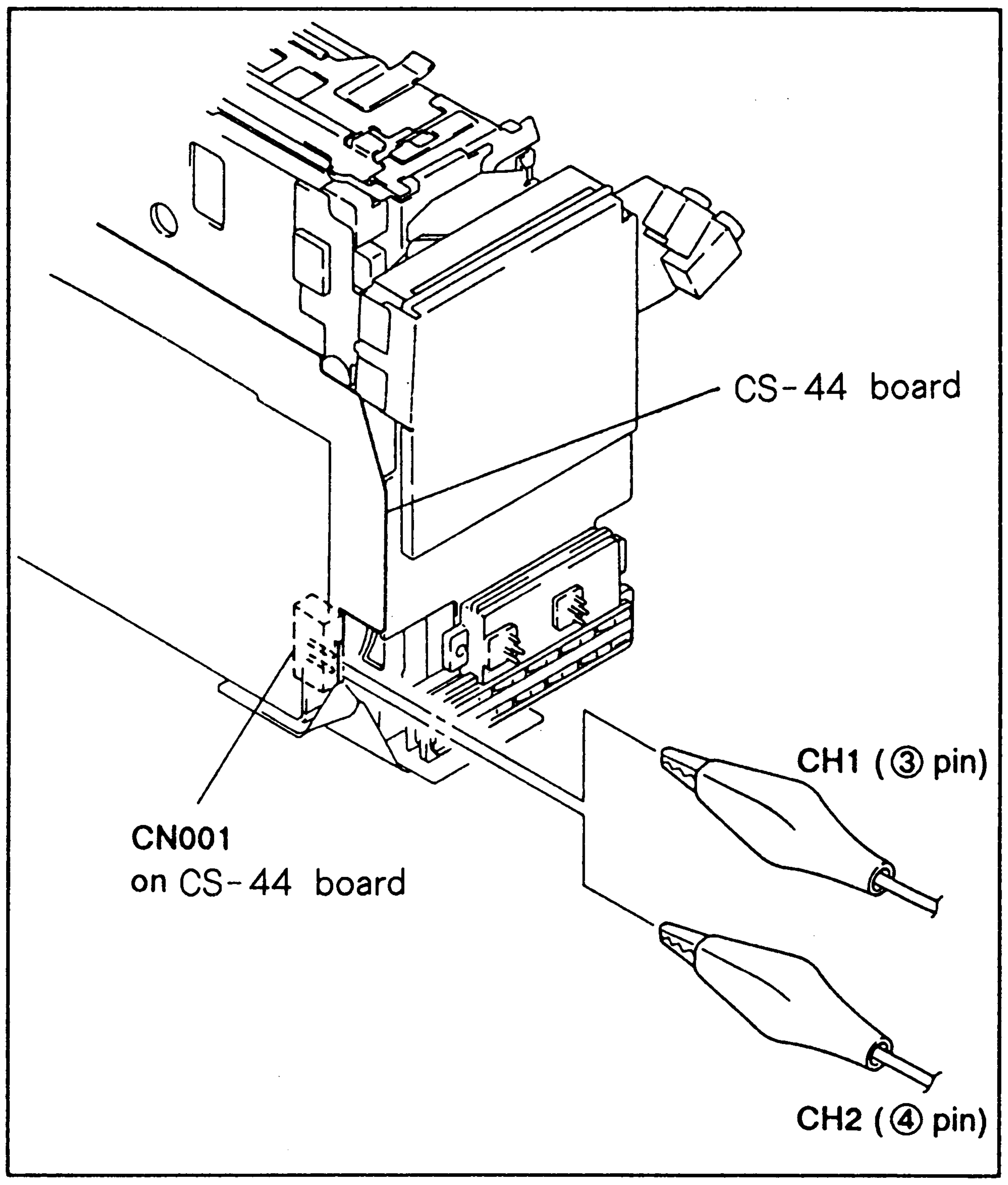


Fig.8-1.

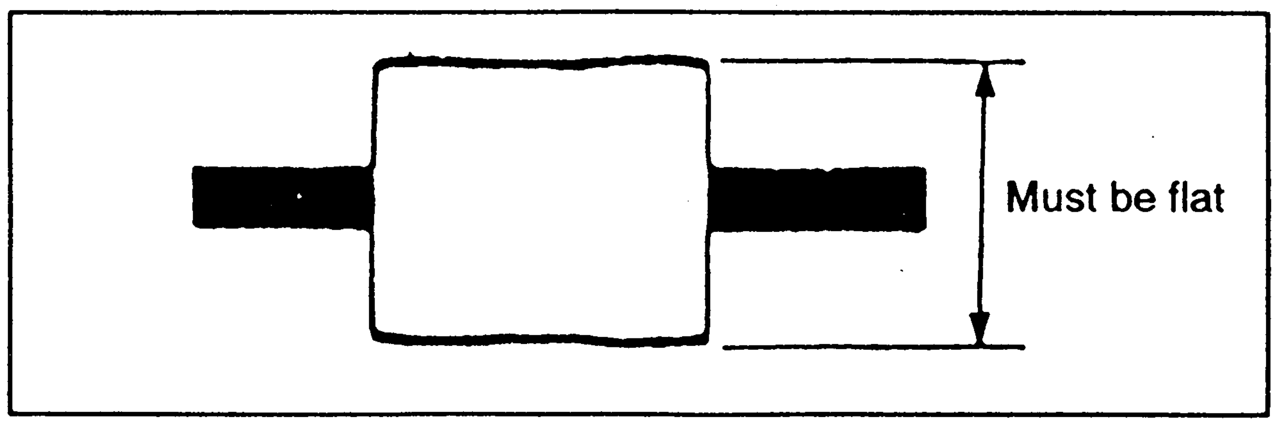


Fig.8-2.

SECTION 9
VIDEO SECTION ADJUSTMENTS

When performing adjustments, refer to the layout diagrams for adjustment related parts beginning from page 252.

9-1. PREPARATIONS BEFORE ADJUSTMENT

The following adjusting instruments are used for adjusting the video section.

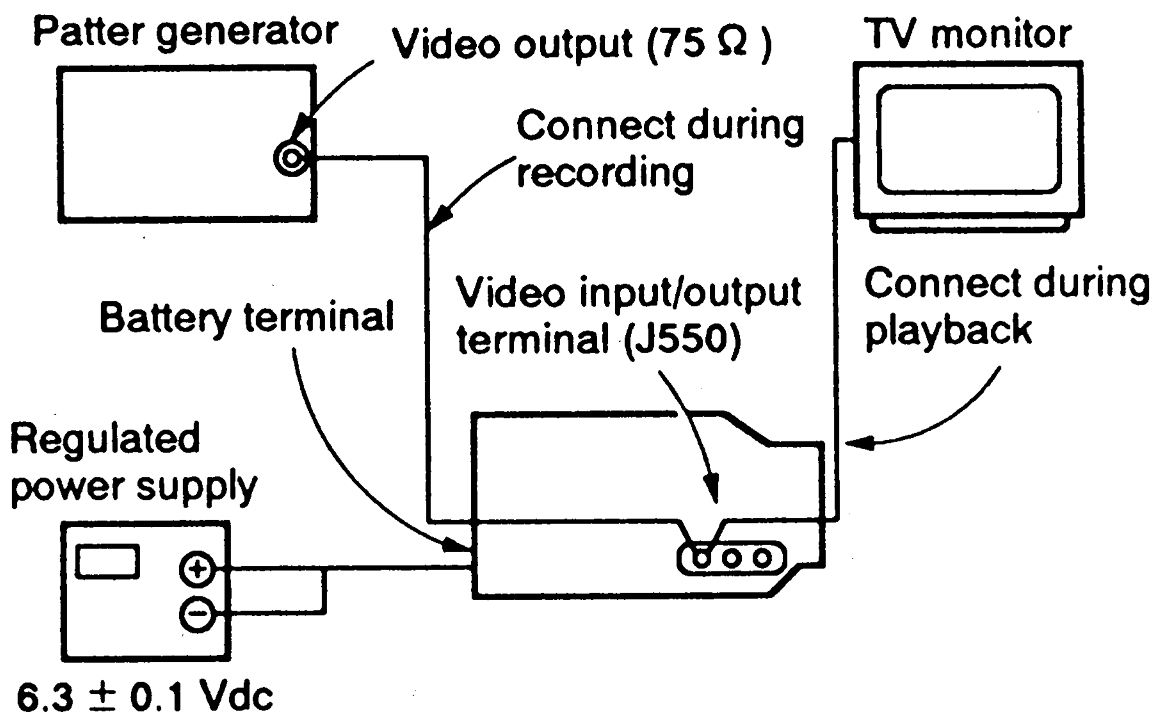
9-1-1. Equipments to be used

1) TV monitor
2) Oscilloscope: 2 phenomena, band 30 MHz or wider, with delay mode. (Use a 10:1 probe unless specified otherwise.)
3) Frequency counter
4) Pattern generator with video output terminal
5) Digital voltmeter
6) Audio generator
7) Audio level meter
8) Audio distortion meter
9) Audio attenuater
10) Regulated power supply
11) Alignment tape
    For tracking adjustment (WR5-1NP)
    Part Code: 8-967-995-02
    For video frequency characteristics adjustment (WR5-6N)
    Part Code: 8-967-995-12
    For checking operations
    (WR5-4NL)[Note 1]
    Part Code: 8-967-995-51
    (WR5-5NSP)[Note 2]
    Part Code: 8-967-995-42
    For checking AFM stereo operations (WR5-9NS)
    Part Code: 8-967-995-23
    Note: The following alignment tapes can also be used.
    1) WR5-3NL (8-967-995-31)
    2) WR5-4NSP (8-967-995-41)
12) Remote control unit for adjustment (J-6082-053-A)
13) VA-83 board extension cord (20P, 0.8 mm)
    Part Code: J-6082-169-A
14) VA-83 board extension cord (40P, 0.8 mm)
    Part Code: J-6082-168-A
15) Mecha deck extension cord (30P, 0.8 mm)
    Part Code: 6082-167-A

9-1-2. Connecting the equipments

Unless specified otherwise, connect the measuring instruments as shown in Fig. 9-1 and perform the adjustments.

- Camera/video power switch ·········Position of the video
- Input/output switchover switch
  ··········· Input position (Record mode)
  Output position (Playback mode)
- Connect the adjusting remote control unit to the remote terminal (PS-312 board J951).


Patter generator
Video output (75 Ω)
TV monitor
Connect during recording
Battery terminal
Video input/output terminal (J550)
Connect during playback
Regulated power supply
6.3 ± 0.1 Vdc

To connect the pattern generator and TV monitor simultaneously, adjust the input/output switchover switch to the [input] position, and connect the pattern generator to the video input/output terminal.
Connect the TV monitor as follows.

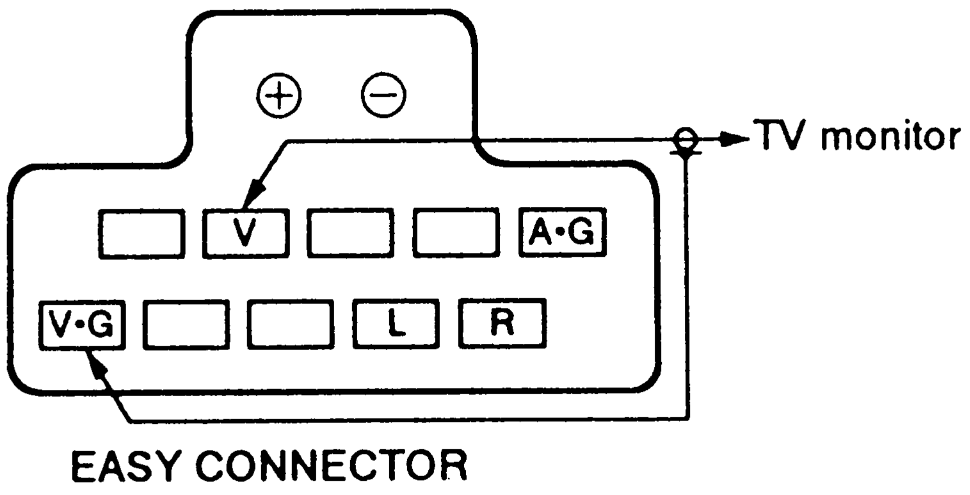

⊕ ⊖
TV monitor
V
A·G
V·G
L
R
EASY CONNECTOR

Fig. 9-1.

9-1-3. Precautions upon Adjustment

The MA-168 board (Mic amplifier) is not required for adjusting the video section. Disconnect CN571 (9 pins) on VK-30 board.

- Remove the following connector if the focus ring gets in the way.
  1. CN852 of CS-44 board (8 pins)

- Remove the two lens block installing screws and the following connectors if the lens block gets in the way.
  1. CN801 of the CS-44 board (18 pins)
  2. CN851 of the CS-44 board (20 pins)
  3. CN902 of the CD-112 board (5 pins)

- Use an extension cable when opening the VA-74 board.
  1. Between CN201 of VA-83 board and CN503 of CS-44 board.
     40 pins, 0.8 mm pitch extension cable (J-6082-168-A)
  2. Between CN202 of VA-83 board and CN504 of CS-44 board.
     20 pins, 0.8 mm pitch extension cable (J-6082-169-A)

- Use an extension cable when opening the CS-44 board, and when checking the operation of the mechanical section.
  1. Between CN502 of CS-44 board and FP-425 board.
     30 pins, 0.8 mm pinch extension cable (J-6082-167-A)

- If cabinet (R) gets in the way, remove the following connectors after setting to the forced POWER ON mode using the adjusting remote control unit.
  1. CN505 of the CS-44 board (16 pins)

[How to set the forced POWER ON mode]

1. Release the protect of page D with the adjusting remote control unit.
   Page: 1, Address: 00, Data: 01
2. Select address 21 of page D.
3. When the power is turned on in the VTR mode, set data 02. (Set data 01 when the power is turned on in the CAMERA mode.)
4. Press the PAUSE button of the adjusting remote control unit.
5. Disconnect the main power supply (6.3V).

The forced POWER ON mode has been set by the above operations. Hereafter, when the main power is supplied, the power will turn on in the VTR mode (or CAMERA mode). As the position of the power supply switch (CAMERA/OFF/VTR) and the presence/absence of the power supply switch becomes unrelated, the cabinet (R) can be removed.
Be sure to release the forced POWER ON mode after completing repair/adjustment.

[How to release the forced POWER ON mode]

1. Release the protect of page D.
   Page: 1, Address: 00, Data: 01
2. Select address 21 of page D, and set data: 00.
   (Forced POWER ON mode releasing)
3. Press the PAUSE button of the adjusting remote control unit.

9-1-4. Set-up during Adjustment

As the video signal obtained from the pattern generator is used as an adjustment signal during electric adjustments, ensure that this video output signal is within the specification. Connect the oscilloscope to pin ⑧ of CN400 on the VA-83 board, and check that the amplitude of the sync signal of the video signal is approximately 0.3V, the amplitude of the video section is approximately 0.7V, the amplitude of the burst signal is approximately 0.3V and flat, and that the level ratio of the burst signal and the [red] signal is 0.30: 0.66. The video signal (color bar) used for electric adjustments is shown in Fig. 9-2.

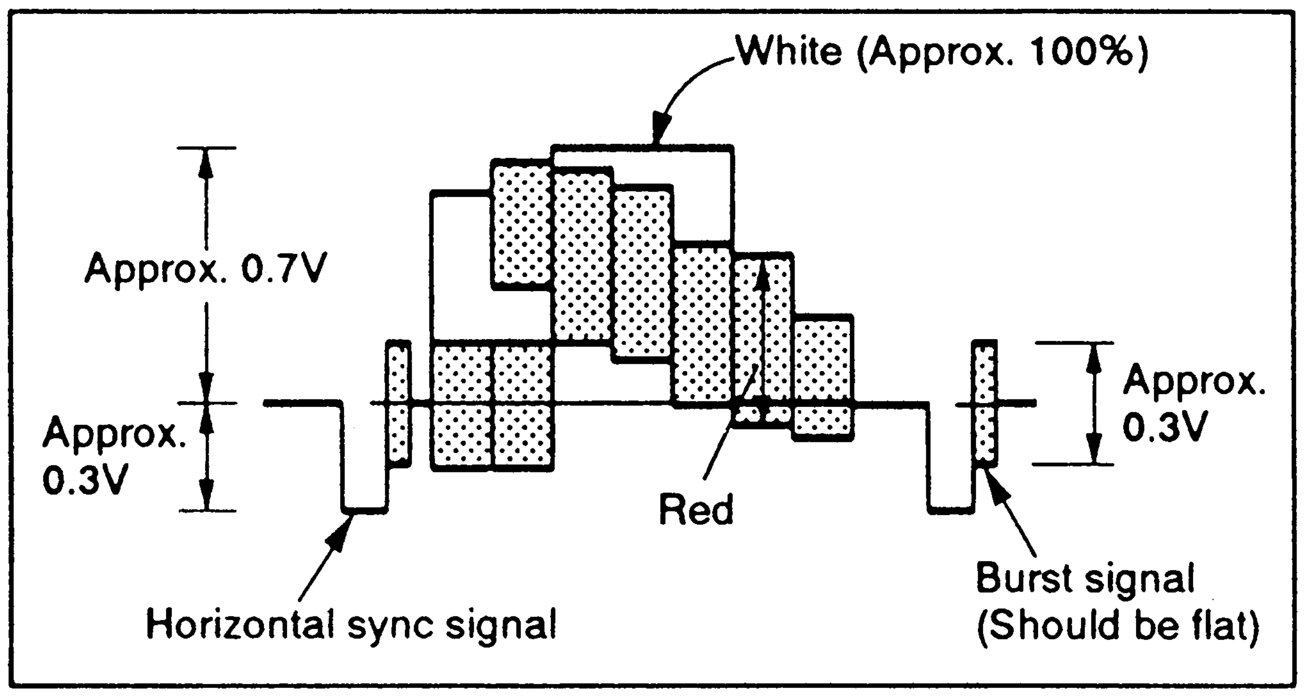


Fig. 9-2. Color Bar Signal of the Pattern Generator

9-1-5. Alignment Tape

The following table lists alignment tapes which are available.
Use the tape specified in the signal column for each adjustment.
If the type of tape to be used for checking operations is not specified, use whichever type.

Name	**Record-ing mode**	**Tape type**	**Tape speed**	**Recording contents**		**Usage**
				Video area	**PCM area**	
Tracking WR5-1NP	L	MP	SP	CH2: Signal for 1 MHz tape path adjustment		Tape path adjustment Switching position adjustment
Video frequency characteristics WR5-6N	L	MP	SP	RF sweep 0 to 10 MHz Marker 1, 3.58, 5.5, 7 MHz		Frequency characteristics adjustment
Operation check (SP mode) WR5-5NSP	L	MP	SP	• Video signal Color bar 4 minutes Monoscope 4 minutes • Audio signal (AFM) 400 Hz 60% modulation	• Audio signal (PCM) Monoscope section 20 Hz 20 sec. } 400 Hz 20 sec. } Color bar section 14 kHz 20 sec. } Repeated 4 times 1 kHz 4 minutes	Checking operations
Operation check (LP mode) WR5-4NL	L	MP	LP	• Video signal Color bar 4 minutes Monoscope 4 minutes • Audio signal (AFM) 400 Hz 60% modulation		
AFM stereo Operation check WR5-9NS	L	MP	SP	• Video signal Color bar 4 minutes Monoscope 4 minutes • Audio signal (AFM) Stereo section (color bar) Lch: 400 Hz, Rch: 1 kHz (L+R: 1.5 MHz ± 60 kHz DEV L–R: 1.7 MHz ± 30 kHz DEV) Bilingual section (Monoscope) MAIN: 400 Hz (1.5 MHz ± 60 kHz DEV) SUB: 1 kHz (1.7 MHz ± 30 kHz DEV)	• Audio signal (PCM) 400 Hz	AFM stereo Checking operations

Note: Recording mode

L	Conventional mode
E	hi8 (hi band) mode

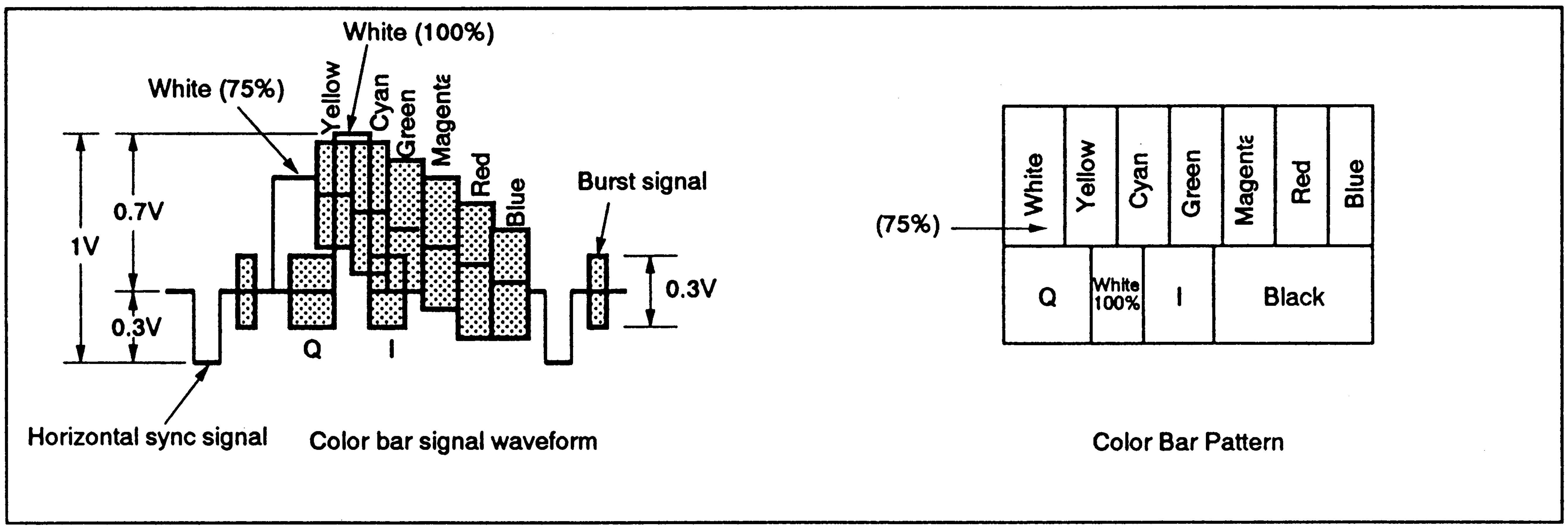
Tape type

MP	Particle type metal tape
ME	Evaporated type metal tape

Table 9-2.

Fig. 9-3. shows the 75% color bar signals recorded on the alignment tape.

Note: Measure using the video input/output terminal (Terminated at 75 Ω)


White (100%)
White (75%)
Yellow
Cyan
Green
Magenta
Red
Blue
Burst signal
0.7V
1V
0.3V
0.3V
Q
I
Horizontal sync signal
(75%)
White
Yellow
Cyan
Green
Magenta
Red
Blue
Q
White 100%
I
Black

Color bar signal waveform

Color Bar Pattern

Fig. 9-3. Color Bar Signals of the Alignment Tape

9-1-6. Input/Output Level and Impedance

Video input	Pin jack Input signal: 1 Vp-p, 75 Ω unbalanced, sync negative
Video output	Pin jack Output signal: 1 Vp-p, 75 unbalanced, sync negative
Audio input	Pin jack Input level: –7.5 dBs (odBs=0.775 Vrms) Input impedance: Above 47 kΩ
Audio output	Pin jack Specified output: –7.5 dBs Output impedance: Below 2.2 kΩ

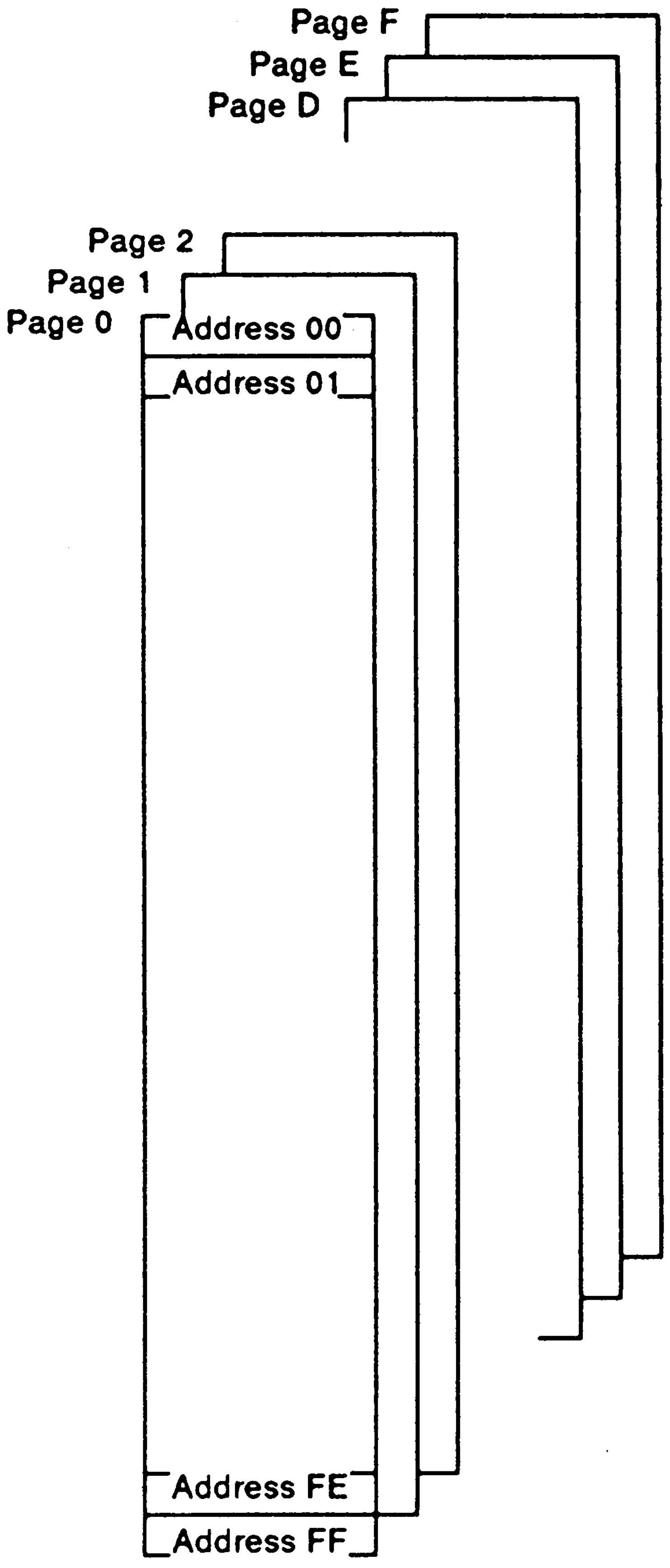
9-1-7. Service Mode

1. Setting the Service mode

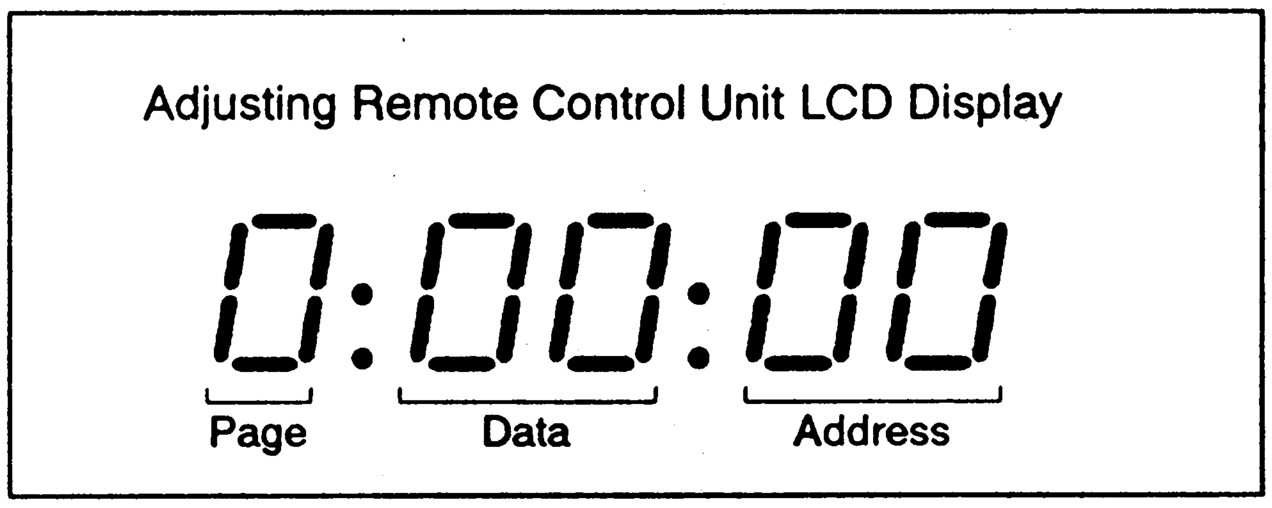
The service mode consists of the adjustment mode which adjusts the EVR and the test mode which displays the condition of the unit.

The unit can be shifted into the test mode and adjustment mode by connecting the adjusting remote control unit (set the HOLD switch to the HOLD side).

(1) Service LANC memory map

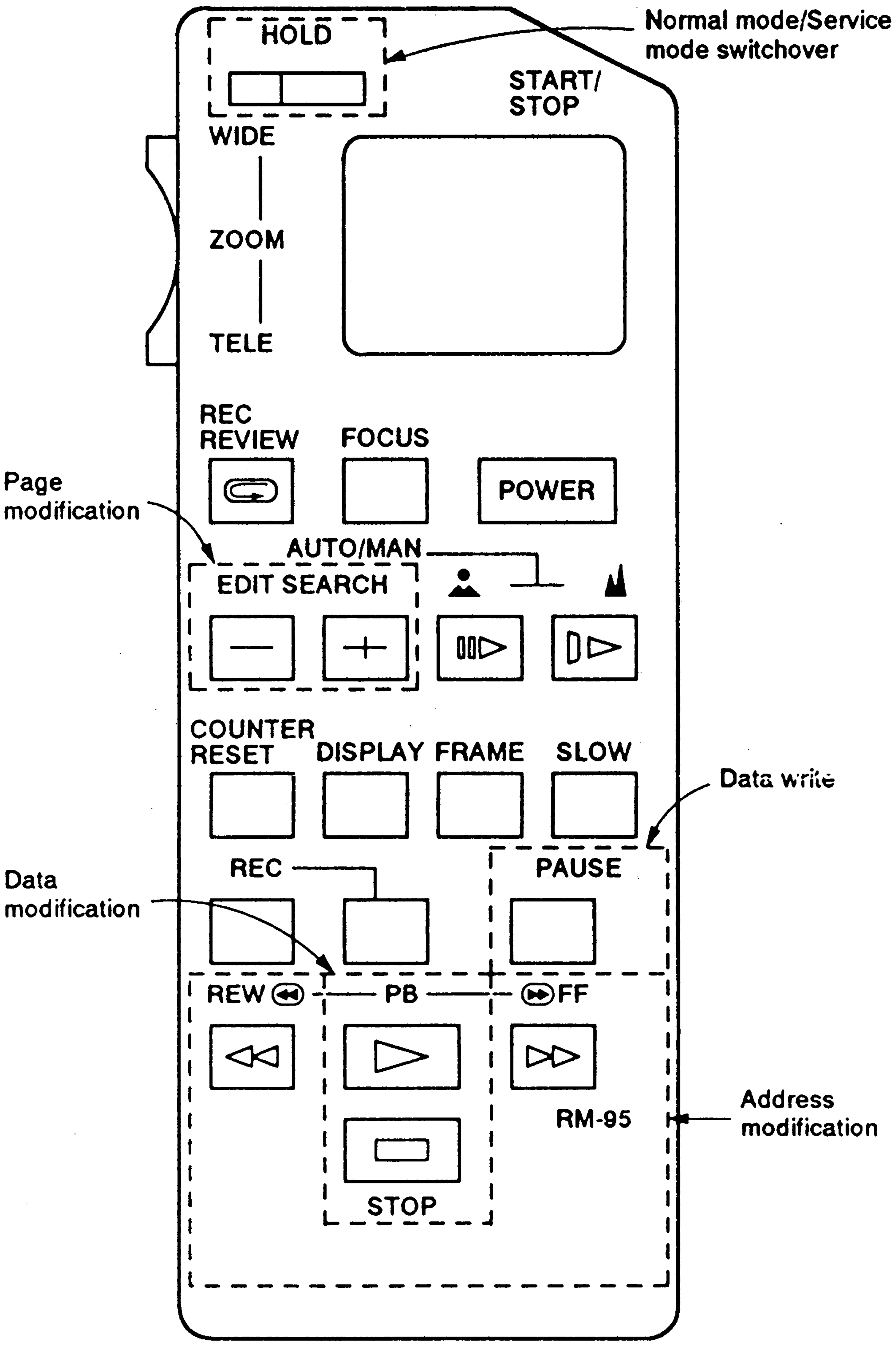


Page F
Page E
Page D
Page 2
Page 1
Page 0
Address 00
Address 01
Address FE
Address FF



Adjusting Remote Control Unit LCD Display
0:00:00
Page
Data
Address

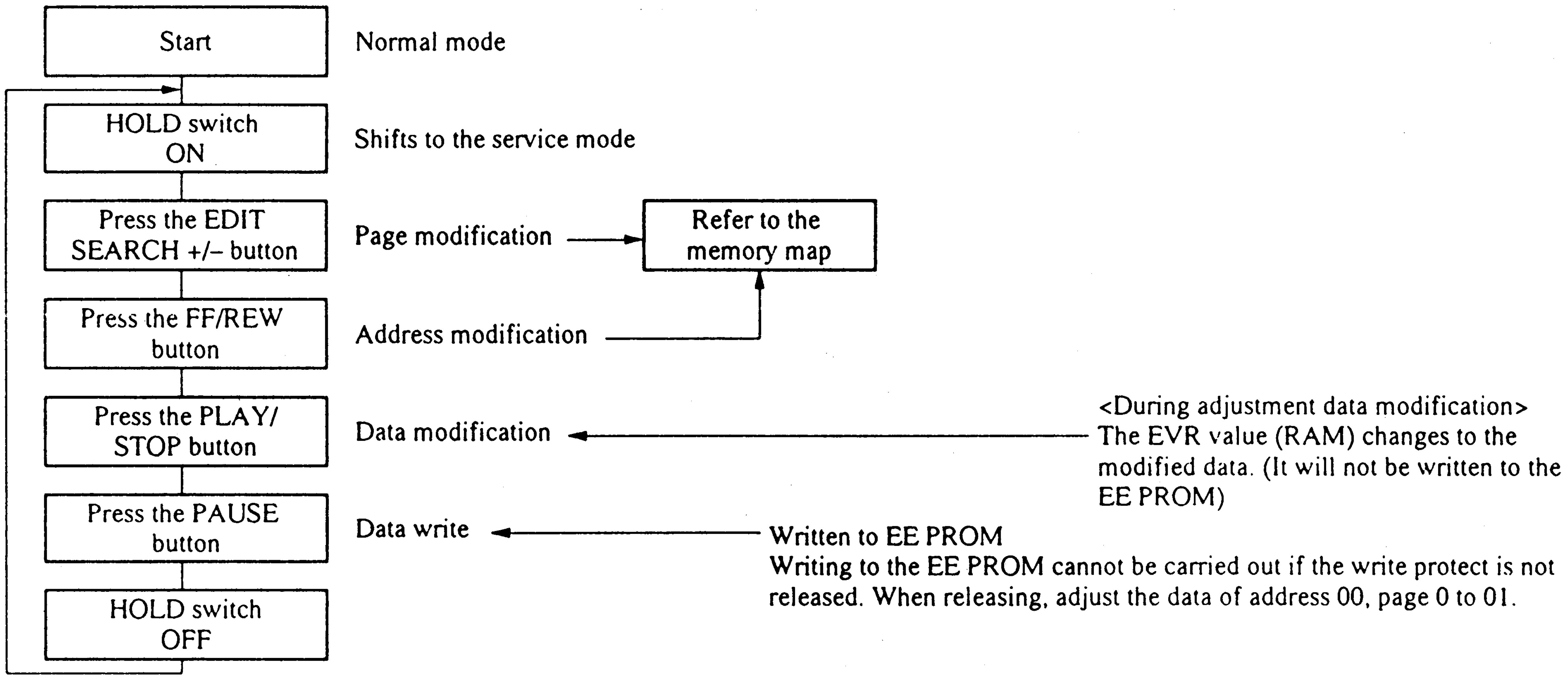
Adjusting remote control unit RM-95 (J-6082-053-A)



HOLD
Normal mode/Service mode switchover
START/ STOP
WIDE
ZOOM
TELE
REC REVIEW
FOCUS
POWER
Page modification
AUTO/MAN
EDIT SEARCH
COUNTER RESET
DISPLAY
FRAME
SLOW
Data write
Data modification
REC
PAUSE
REW
PB
FF
STOP
RM-95
Address modification

Page	Page allocation	Description
0	Not used	
1	Mode Control RAM, I/O	RAM and I/O interface data memory area required for operating the mode controller. Data is not held when the power is turned off because this area is not ROM.
2~4	Mechanical Control RAM, I/O	RAM and I/O memory area of the mechanical controller.
5	Not used	
6~8	Camera Control RAM, I/O	RAM and I/O memory area of the camera control.
9	Not used	
A	Camera Control RAM, I/O	RAM and I/O memory area of the camera control.
B, C	Not used	
D	VTR EE-PROM	ROM memory area of the VTR part. Data of this area is held by EE-PROM when the power is turned off. Releasing protect is required for changing data.
E	Not used	
F	Camera EE-PROM	ROM memory area of the camera part. Data of this area is held by EE•P•ROM when the power is turned off.

(2) Shifting to the Service Mode Using the Adjusting Remote Control Unit


Start
Normal mode
HOLD switch ON
Shifts to the service mode
Press the EDIT SEARCH +/– button
Page modification
Refer to the memory map
Press the FF/REW button
Address modification
Press the PLAY/ STOP button
Data modification
Press the PAUSE button
Data write
HOLD switch OFF

<During adjustment data modification>
The EVR value (RAM) changes to the modified data. (It will not be written to the EE PROM)

Written to EE PROM
Writing to the EE PROM cannot be carried out if the write protect is not released. When releasing, adjust the data of address 00, page 0 to 01.

Command Name	Command Function	Normal LANC command
Page Up	Page +1	Edit Search +
Page Down	Page –1	Edit Search –
Direc Page Set	Sets the specified page	Event Clear
Address Up	Address +1	Fast Forward
Address Down	Address –1	Rewind
Data Up	Data +1	Play Back
Data Down	Data –1	Stop
Store	Write the data to the EE PROM. RAM	Pause

2. Types of Self-diagnostic Feature

MODE		Contents
TEST	Camera adjustment	Refer to Camera Adjustment
	Switching position adjustment	Refer to each adjustment page
	Battery DOWN adjustment	
	Video, Audio adjustment	
ADJUST	Pass Adjustment track shift	When adjusting tape pass, set this mode and shift the tracking.
	Emergency STOP inhibition	Detection of emergency is inhibited. This allows the following items. • Power is not turned off when the battery is ended. • SP/LP is not automatically distinguished. • Emergence is not detected except for TOP/END detection of the TAPE.
	Read of emergence code	The following functions are added to the emergency display function currently in use. ① The lithium battery is not required because to memorize into EE-PROM is allowed. ② The first emergency and the last emergency are memorized. ③ The mode when the emergency is generated is memorized, in addition to the emergency contents.
	Motor single check	Rotating in forward direction, reverse direction, stopping of each motor can be separately controlled. • Drum motor • Capstan motor • Loading motor
	Function switch check	The acceptance of the function switch of the unit can be confirmed by designating an address. On the contrary, RM-95 can command the substitution for the function switch of the unit.
	Mechanical switch check	The contents of the mechanical switch and the mode switch can be confirmed.
	Sensor check	The following sensor is input by performing A/D converting, and the A/D converted value can be confirmed. TOP sensor, End sensor, S REEL FG, T REEL FG, Thermistor for SWP correction, DEW sensor.
	Reception contents check of wireless remote control	The received code contents of the remote control code can be confirmed.

3. Page D Write Protect

Release/set the page D write protect.

Page 1	Address 00

Data	Function
00	Normal (Write protect condition)
01	Write protect release

4. Page F Write Protect

Release/set the page F write protect.

Page 6	Address 00

Data	Function
10	Normal (Write protect condition)
01	Write protect release

5. Test Mode Setting

Each type of test mode is set/released. Release the protect (page: 1, address: 00, data: 01), before setting the data.

Page D	Address 01

Data	Function
00	Normal
01	Test mode 1 Various emergency inhibition and release Drum, capstan, loading motor, reel, tape top, end, DEW SP/LP automatic distinction inhibition, manual switchover (EDIT SW ON: LP, OFF: SP) 5 minutes pause release inhibition Power off inhibition • release by battery end
02	Test mode 2 1'CH frequency response adjustment SP/LP automatic distinction inhibition, manual switchover (EDIT SW ON: LP, OFF: SP)
03	Test mode 3 Track shift Plays back the track shift Rear lock distinction inhibition during PB SP/LP automatic distinction inhibition, manual switchover (EDIT SW ON: LP, OFF: SP)
04	Test mode 4 Rear lock mode Rear lock playback is performed SP/LP automatic distinction inhibition, manual switchover (EDIT SW ON: LP, OFF: SP)
05	Test mode 5 SP/LP automatic distinction inhibition, manual switchover (EDIT SW ON: LP, OFF: SP)

※ This address data will be recorded on the non-volatile memory by pressing the PAUSE button on the adjusting remote control unit. Take note, as when this happens, the test mode will not be released even if the main power is turned off (6.3 Vdc).

※ Be sure to return the data of this address data to 00 after completing adjustments/repairs.

6. Emergency code

Troubles (errors) can be checked.

Page D	Address 06

First emergency code

……The first error code generated

Page D	Address 07

Last emergency code

…… The last error code generated (this data will be modified each time an error occurs.)

※ Be sure to rewrite the data of addresses 06 and 07 to 00 after completing repairs/adjustments.

※ When rewriting data, be sure to press the PAUSE button of the remote control unit after resetting the data.

Code	Error condition
00	No error
01	Loading motor error
02	Reel error during unloading
03	Other reel errors
04	Capstan error
05	DRUM FG error during drum start up
06	DRUM PG error during drum start up
07	DRUM FG error during drum regular condition
08	DRUM PG error during drum regular condition
09	DRUM Phase error during drum regular

7. Emergency mode

The operation mode during an error outbreak can be checked.

Page D	Address 08

First emergency mode
……The operation mode when the first error is generated

Page D	Address 09

Last emergency mode
……The operation mode when the last error is generated
(This data will be modified each time an error occurs.)

※ Be sure to rewrite the data of addresses 08 and 09 to 00 after completing repairs/adjustments.

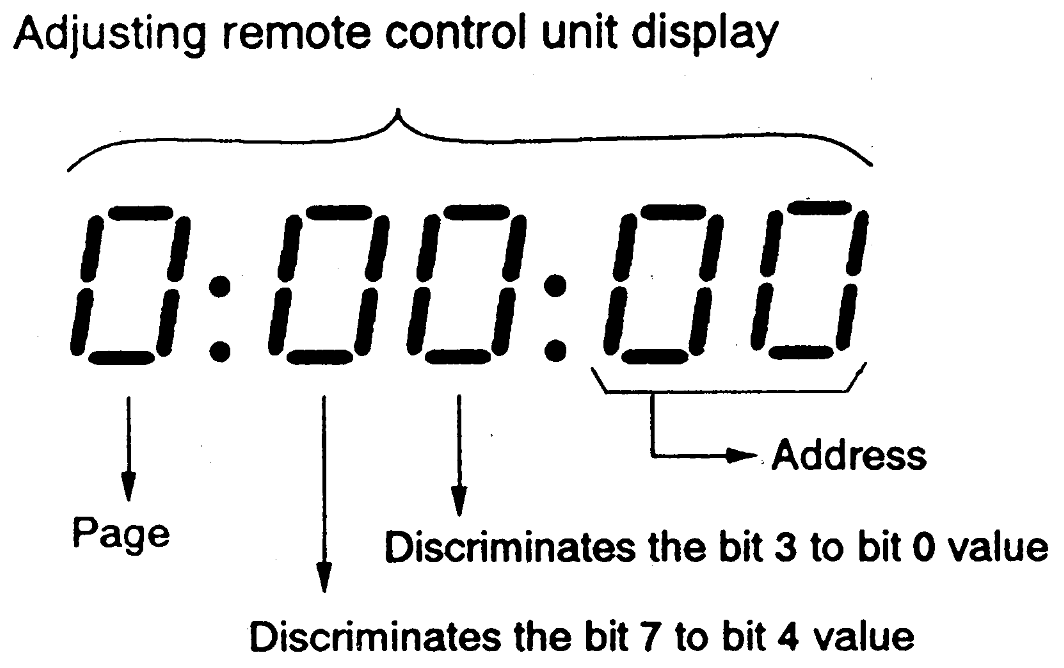
※ When rewriting data, be sure to press the PAUSE button of the remote control unit after setting the data.

※ Addresses 08 and 09 of page 0 and addresses 08 and 09 of page D have the same functions.

Code	Error condition
00	BEFOR INITIALIZE
01	EJECTED
02	NORMAL STOP
03	FF
04	NORMAL REC
06	NORMAL PB
07	PB PAUSE
12	LOADING
14	REC PAUSE
26	X1
27	1/5 SLOW
31	UNLOADING
36	-X1
37	-1/5 SLOW
46	CUE
47	1/10 SLOW
56	REVIEW
57	-1/10 SLOW
62	STOP TAPE END
66	X2
67	FRAME
72	STOP TAPE TOP
76	-X2
77	-FRAME
83	REWIND
85	REC REVIEW(+)
95	REC REVIEW(-)
A2	EMERGENCY STOP
A5	EDIT SEARCH(+)
B1	EMERGENCY UNLOADING
B2	STOP EMERGENCY 1
B5	EDIT SEARCH(-)
C2	STOP EMERGENCY 2
E2	STOP NO CASSETTE
F5	EDIT PAUSE

8. Bit value Discrimination

It is necessary to discriminate the bit value by the adjusting remote control unit display data for the following items. Discriminate if the bit value is "1" or "0" using the following table.


Adjusting remote control unit display
0:00:00
Address
Page
Discriminates the bit 3 to bit 0 value
Discriminates the bit 7 to bit 4 value

Remote Control Unit Display	Bit Value			
	bit 3 or bit 7	bit 2 or bit 6	bit 1 or bit 5	bit 0 or bit 4
0	0	0	0	0
1	0	0	0	1
2	0	0	1	0
3	0	0	1	1
4	0	1	0	0
5	0	1	0	1
6	0	1	1	0
7	0	1	1	1
Ⓐ→ 8	1	0	0	0
9	1	0	0	1
A (A)	1	0	1	0
B (b)	1	0	1	1
C (c)	1	1	0	0
D (d)	1	1	0	1
Ⓑ→ E (E)	1	1	1	0
F (F)	1	1	1	1

(Example) When the remote control unit display data is "8E", the bit values of bit 7 to bit 4 can be discriminated from column Ⓐ, and that of bit 3 to bit 0 can be discriminated from column Ⓑ.

9. Check of Power Switch, Tape Distinction Switch, etc.

Page 1	Address 3E

Bit7	Bit6	Bit5	Bit4	Bit3	Bit2	Bit1	Bit0
				$\overline{\text{REC PROOF}}$	ME/$\overline{\text{MP}}$	Hi8/$\overline{\text{Normal}}$	HG/$\overline{\text{Normal}}$

"1"=HG tape
"0"=Others

"1"=Recording impossible
"0"=Recording possible

"1"=ME tape
"0"=MP tape

"1"=Hi8 mode playback
"0"=Normal mode playback

Page 1	Address 23

Bit7	Bit6	Bit5	Bit4	Bit3	Bit2	Bit1	Bit0
					$\overline{\text{CC DOWN}}$		

"0"=During cassette compartment lock

10. RECOG SW Check

Page 1	Address 3D

Bit7	Bit6	Bit5	Bit4	Bit3	Bit2	Bit1	Bit0
V MUTE	A MUTE	VA PB MODE	JOG	PB CLOG	REC CLOG	SYNC DET	LP/$\overline{\text{SP}}$

"1"=LP mode playback
"0"=SP mode playback

"1"=SYNC is detected
"0"=SYNC is not detected

"1"=CLOG is detected
"0"=Normal

"1"=When the PB RF signals are being playback normaly
"0"=Others

"1"=JOG mode
"0"=Other

"1"=Playback mode
"0"=Others

"1"=AUDIO MUTE: ON
"0"=AUDIO MUTE: OFF

"1"=VIDEO MUTE: ON
"0"=VIDEO MUTE: OFF

11. Individual Operations of the Drum, Capstan, and Loading Motor

Page 4	Address 11

1) Adjust the mechanical section to the loading completion condition.
2) Release the protect.
   Page: 1, address: 00, data: 01
3) Set data: 01 to page: 4, address: 0E.
   (Control permission from the adjusting remote control unit of the motor)
4) By setting the data in the following table to page: 4, address: 11, the corresponding motors can be operated individually.
5) After checking the operations, turn off the main power (6.3 Vdc).

Data	Operation
00	Normal
02	Drum forward rotation
04	Drum reverse rotation
06	Capstan forward rotation
08	Capstan reverse rotation
0A	Loading motor forward rotation
0C	Loading motor reverse rotation
03	All motors stop
05	
07	
09	
0B	
0D	
0F	

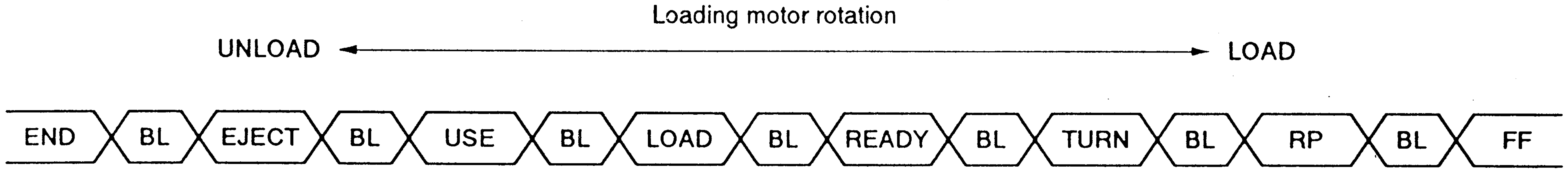
12. Mode Switch Check

The mode switch position (mechanical section condition) can be checked.

Page 1	Address 3E

Bit7	Bit6	Bit5	Bit4	Bit3	Bit2	Bit1	Bit0
MSW 0	MSW 1	MSW 2					

			POSITION	FUNCTION	$\overline{\text{CC DOWN}}$
0	0	0	BL	Interval of each position	
0	1	1	END	FULL END processing (T side lock removal)	1
0	0	1	EJECT	Cassette compartment ejection	1
1	0	1	USE	EJECTED (Unskate end)	1
0	0	1	LOAD	LOADING (Skate in)	0
1	0	0	READY	NORMAL STOP position	0
1	1	0	TURN	OFF of pinch roller only with PB ↔ REV (oscillating position)	0
0	1	0	RP	PB, REC, RVS, REV, REW	0
0	0	0	FF	FF/CUE	0



13. Mode control micro processor key matrix check

The key input can be checked.

Page 1	Address 68~6D

	Bit7	Bit6 (K IN 6)	Bit5 (K IN 5)	Bit4 (K IN 4)	Bit3 (K IN 3)	Bit2 (K IN 2)	Bit1 (K IN 1)	Bit0 (K IN 0)
Address 68 (K OUT 0)		BEEP ON/OFF	VTR POWER	EDIT SEARCH (+)	EDIT SEARCH (−)		START/STOP	STANDBY
Address 69 (K OUT 1)			CAMERA POWER	ZERO MEMORY	COUNTER RESET	FF	REW	EJECT
Address 6A (K OUT 2)			REMOTE ON/OFF	PROGRAM AE	TAPE/BATT CHECK	STOP	PLAY	EDIT ON/OFF
Address 6B (K OUT 3)			EVENT	TIME	DATE	PAUSE	REC	HI-FI SOUND 1 (MAIN)
Address 6C (K OUT 4)			MEMORY	BACK LIGHT	FADER			HI-FI SOUND 2 (SUB)
Address 6D (K OUT 5)		AUTO FOCUS ON/OFF	AUTO LOCK	SUPER IMPOSE ON/OFF	COLOR/MODE			

14. Wireless Remote Control Unit Reception Content Check

Page 1	Address 1E

Wireless remote control unit key pressed	Data
None	FF
TELE	9A
WIDE	9B
Start/stop	99
Rewind	1B
Fast forward	1C
Stop	18
Playback	1A
Data screen	5A
Pause	19
SLOW	23

15. Page D Address List

Note 1: The adjustment data initial value is the data to be input before performing video section adjustment (page D), when the page D data has been erased due to some cause.

Note 2: The data listed in the adjustment data memo column are the fixed data.
Check that these data have not been accidentally rewritten, after completing adjustments.

Address	Name	Function [ ] Indicate the adjustment voltage output terminal	Adjustment data	
			Initial value	Memo column
00	Category code	Not used	00	00
01	Test mode		00	00
02	Destination flag		49	49
03	BATT END	Battery end adjustment	90	
04	SW POSITION	SW POSITION adjustment	80	
05	SW POSITION	SW POSITION adjustment	0B	
06	EMERGENCY code (FIRST)	Error code and mode are memorized. Rewrite the data of these addresses to 00 after repairs/adjustments	00	00
07	EMERGENCY code (LAST)		00	00
08	EMERGENCY mode (FIRST)		00	00
09	EMERGENCY mode (LAST)		00	00
0A	SR DATA (MP NORMAL SP)	CXA1207 serial data	24	24
0B	SR DATA (MP NORMAL LP)	CXA1207 serial data	3E	3E
0C	SR DATA (ME Hi8 SP)	CXA1207 serial data	24	24
0D	SR DATA (ME Hi8 LP)	CXA1207 serial data	3E	3E
0E	SR DATA (ME NORMAL SP)	CXA1207 serial data	24	24
0F	SR DATA (ME NORMAL LP)	CXA1207 serial data	3E	3E
10	SR DATA (MP Hi8 SP)	CXA1207 serial data	24	24
11	SR DATA (MP Hi8 LP)	CXA1207 serial data	3E	3E
12	SR DATA (EDIT ON NORMAL)	CXA1207 serial data	24	24
13	SR DATA (EDIT ON Hi8)	CXA1207 serial data	3E	3E
14	CAM TITLE BLU R-Y	Camera titler color adjustment [Blue]	74	
15	CAM TITLE BLU B-Y	Camera titler color adjustment [Blue]	DA	
16	CAM TITLE GRN R-Y	Camera titler color adjustment [Green]	3E	
17	CAM TITLE GRN B-Y	Camera titler color adjustment [Green]	2C	
18	CAM TITLE CYN R-Y	Camera titler color adjustment [Light blue]	32	
19	CAM TITLE CYN B-Y	Camera titler color adjustment [Light blue]	86	
1A	CAM TITLE RED R-Y	Camera titler color adjustment [Red]	DE	
1B	CAM TITLE RED B-Y	Camera titler color adjustment [Red]	7A	
1C	CAM TITLE VIO R-Y	Camera titler color adjustment [Violet]	C2	
1D	CAM TITLE VIO B-Y	Camera titler color adjustment [Violet]	D4	
1E	CAM TITLE YEL R-Y	Camera titler color adjustment [Yellow]	8C	
1F	CAM TITLE YEL B-Y	Camera titler color adjustment [Yellow]	26	
20		X2MUTE, SIRCS EJECT etc	6D	6D
21		FORCED VTR ON, CAM ON etc DATA — MODE 01 — FORCED CAMERA POWER ON 02 — FORCED VTR POWER ON	00	00
22~29		Not used		

Table 9-2 (1).

Address	Name	Function [ ] Indicate the adjustment voltage output terminal	Adjustment data	
			Initial value	Memo column
2A		Slow Blake Adj (FORWARD)	00	00
2B		Slow Blake Adj (REVERSE)	00	00
2C		Still Blake Adj	00	00
2D	BATT REMAIN 1	Amount of remaining battery } Battery end adjustment		
2E	BATT REMAIN 2	Amount of remaining battery		
2F	BATT REMAIN 3	Amount of remaining battery		
30~39		Not used		
3A	MT 1'CH	Not used [IC204 ③]	C0	C0
3B~42		Not used		
43	MT 1CH	1CH playback frequency characteristics adjustment [IC204 ⑲]	C6	
44		Not used		
45	MT 2CH	2CH playback frequency characteristics adjustment [IC204 ②]	C5	
46	REC C RF (EE)	REC C RF adjustment [IC203 ⑩]	B1	
47	REC C RF (PB)	Playback REC C RF level [IC203 ⑩]	00	00
48	RF CONT (ME)	ATF RF level (ME) [IC204 ④]	77	77
49	RF CONT (MP)	ATF RF level (MP) [IC204 ④]	70	70
4A	EE LEVEL	EE level adjustment [IC203 ⑮]	74	
4B		Not used		
4C	COMB ADJ	Chroma comb filter adjustment [IC203 ③]	A6	
4D	SR-IR	IR adjustment [IC203 ②]	A9	
4E		Not used		
4F	CARR	Y-FM carrier frequency adjustment [IC203 ⑤]	A9	
50		Not used		
51	DEV	Y-FM deviation adjustment [IC203 ⑥]	98	
52		Not used		
53		Not used		
54	REC Y (ME)	REC Y recording current adjustment (ME) [IC203 ⑦]	67	
55	REC Y (MP)	REC Y recording current adjustment (MP) [IC203 ⑦]	75	
56	REC Y (PB)	Playback REC Y level [IC203 ⑦]	00	00
57	PB Y (EE)	EE PB Y level [IC204 ⑮]	00	00
58	PB Y (E)	Hi8 PB Y level adjustment [IC204 ⑮]	00	
59	PB Y (L)	Normal PB Y level adjustment [IC204 ⑮]	A6	
5A	EMPH LVL (EE)	EE emphasis input level adjustment [IC203 ④]	89	
5B	EMPH LVL (PB)	Playback emphasis input level adjustment [IC203 ④]	B0	
5C~77		Not used		
78	REC MATRIX	REC matrix adjustment [IC204 ⑫]	A7	
79	PB MATRIX	PB matrix adjustment [IC204 ⑫]	A5	
7A	1.5 IR	1.5 MHz IR adjustment [IC204 ⑤]	96	
7B	1.5 DEV	1.5 MHz deviation adjustment [IC204 ⑥]	7B	
7C	1.7 IR	1.7 MHz IR adjustment [IC204 ⑧]	90	
7D	1.7 DEV	1.7 MHz deviation adjustment [IC204 ⑨]	55	
7E	AUDIO FADER	Audio fader [IC204 ⑦]	00	00
7F~FF		Not used		

Table 9-2 (2)

9-2. POWER SYSTEM ADJUSTMENTS

1. Oscillator Frequency Check (PS-312 board)

Mode	Camera record
Subject	Arbitrary
Measurement Point	Q952 collector
Measuring Instrument	Frequency counter
Specified Value	464 ± 5 kHz

Adjusting method:

1) Check that the oscillator frequency satisfies the specified value.

2. Power Voltage Check (PS-312 board)

Mode	Camera record
Subject	Arbitrary
Measuring Instrument	Digital voltmeter
EVF 5V check	
Measurement Point	Pin ⑥ of CN950
Specified Value	5.01 ± 0.15 Vdc
D5V check	
Measurement Point	Pins ⑰ and ⑱ of CN950
Specified Value	4.98 ± 0.15 Vdc
D4V check	
Measurement Point	Pins ⑮ and ⑯ of CN950
Specified Value	4.03+0.15 Vdc
VIDEO 5V check	
Measurement Point	Pins ② and ④ of CN950
Specified Value	5.00 ± 0.10 Vdc
SS 5V check	
Measurement Point	Pin ㉓ of CN950
Specified Value	5.02 ± 0.15 Vdc
AUDIO 5V check	
Measurement Point	Pin ⑧ of CN950
Specified Value	5.04 ± 0.15 Vdc
CAM5V check	
Measurement Point	Pins ⑬ and ⑭ of CN950
Specified Value	4.90 ± 0.15 Vdc
15V check	
Measurement Point	Pin ⑪ of CN950
Specified Value	15.04 ± 0.4 Vdc
–9V check	
Measurement Point	Pin ⑫ of CN950
Specified Value	–8.5 ± 0.4 Vdc

9-3. SYSTEM CONTROL SYSTEM ADJUSTMENTS

1. Page D Initial Value Input

If the page D data has been erased due to some cause, input the page D initial value before performing adjustments. For details on the initial value, refer to "Page D address list" in "9-1-7. Service Mode".

Mode	E-E
Signal	Arbitrary
Adjustment Page	D
Adjustment Address	00 to 7D

Input method:

1) Release the write protect.
   Page: 1, address: 00, data: 01
2) Select page D, and input the initial value to each address.
   (After setting the data (initial value), be sure to press the PAUSE button of the adjusting remote control unit before changing the address.)

2. Battery End Adjustment

Mode	Camera record
Signal	Arbitrary
Measurement Point	LCD display of the adjusting remote control unit
Measuring Instrument	
Adjustment Page	D
Specified Value	03 (BATT END) 2D (BATT REMAIN 1) 2E (BATT REMAIN 2) 2F (BATT REMAIN 3)

Connection:

1) Connect the regulated power supply and the digital voltmeter as shown in Fig. 9-4.

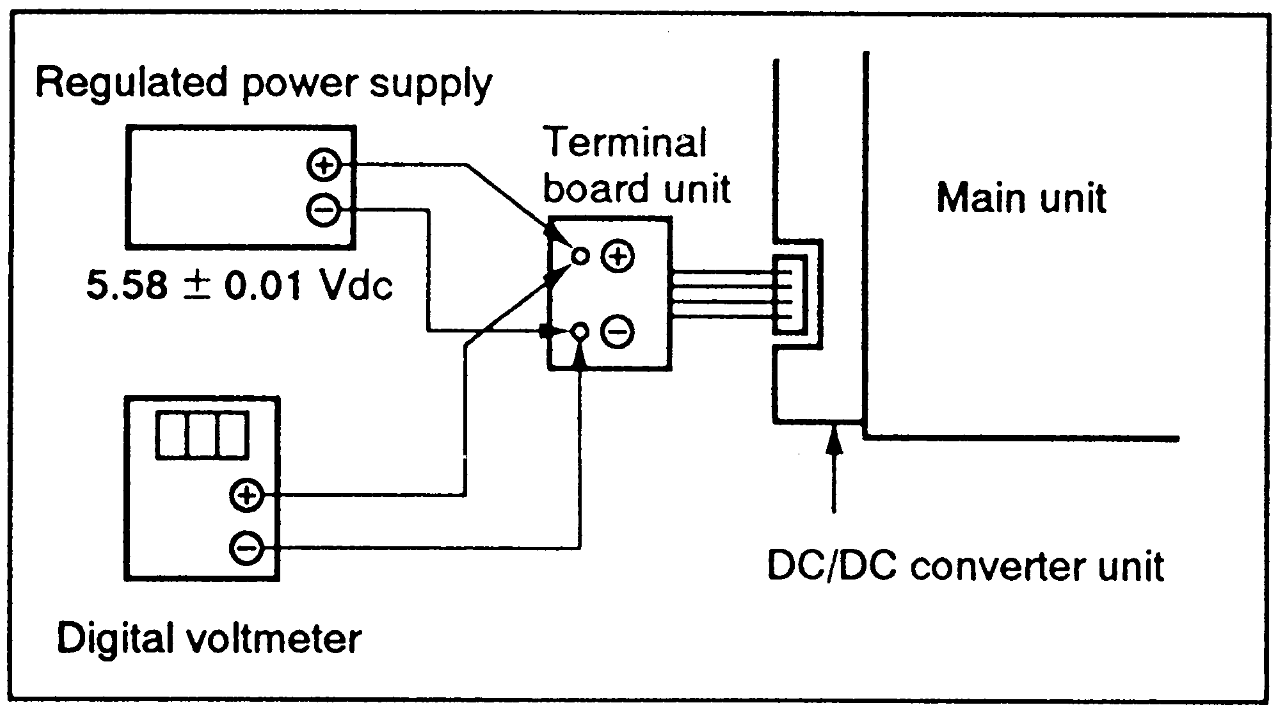


Fig. 9-4.

Adjusting method:

1) Adjust the output voltage of the regulated power supply so that the digital voltmeter display is 6.3 ± 0.1 Vdc.
2) Release the protect.
   Page: 1, address: 00, data: 01
3) Set data: 01 to page: 4, address: 01.
   (Test mode 1 setting)
4) Decrease the output voltage of the regulated power supply so that the digital voltmeter display is 5.58 ± 0.01 Vdc.
5) Select page: 4, address: 10, read the adjusting remote control unit display data, and set to D_{10}.
6) Set data D_{10} to page: D, address: 03, and press the PAUSE button of the adjusting remote control unit.
7) Convert D_{10} to decimal notation, and obtain D_{10}'. (Refer to Table 7-6. "Hexadecimal notation–decimal notation conversion table")
8) Calculate D_{2D}', D_{2E}' and D_{2F}' using following equations (decimal notation calculation).
   $D_{2D}'=D_{10}'+18$
   $D_{2E}'=D_{10}'+14$
   $D_{2F}'=D_{10}'+8$
9) Convert D_{2D}', D_{2E}' and D_{2F}' to hexadecimal notation, and obtain D_{2D}, D_{2E} and D_{2F}.
10) Set data: D_{2D}' to page: D, address: 2D, and press the PAUSE button of the adjusting remote control unit.
11) Set data: D_{2E}' to page: D, address: 2E, and press the PAUSE button.
12) Set data: D_{2F}' to page: D, address: 2F, and press the PAUSE button.
13) Set data: 00 to page: 4, address: 01. (Test mode 1 release)
14) Perform "Battery Down Check".

3. Battery Down Check

Mode	Camera record
Subject	Arbitrary

Connection

1) Connect the regulated power supply and the digital voltmeter as shown in Fig. 9-4.

Checking method:

Remove the adjusting remote control unit, and perform the following check. If the check is not satisfied, perform from the beginning again.

1) Adjust the output voltage of the regulated power supply so that the digital voltmeter display becomes 6.3 ± 0.1 Vdc.
2) Set to the camera recording mode.
3) Decrease the output voltage of the regulated power supply so that the digital voltmeter display becomes 5.80 ± 0.01 Vdc.
4) Check that the 🔋 mark on the EVF (viewfinder) display is not lighted up. (TALLY lamp lights up).
5) Decrease the the output voltage of the regulated power supply so that the digital voltmeter display becomes 5.66 ± 0.01 Vdc.
6) Check that the 🔋 mark and the TALLY lamp on the EVF display on the EVF display blinks every second.
7) Decrease the the output voltage of the regulated power supply so that the digital voltmeter display becomes 5.50 ± 0.01 Vdc.
8) Check that the 🔋 mark and the TALLY lamp on the EVF display are blinking faster, the VTR stops and the power supply turns off.

9-4. SERVO SYSTEM ADJUSTMENTS

1. Switching Position Adjustment (CS-44 board)

Mode	Playback
Signal	Alignment tape: For tracking adjustment (WR5-1NP)
Measurement Point	CH1: Pin ④ of CN001 (RF SWP) CH2: Pin ③ of CN001 (PB RF)
Measuring Instrument	Oscilloscope
Adjustment Page	D
Adjustment Address	04 (SW POSITION) (LOW) 05 (SW POSITION) (HIGH)
Specified Value	t1=0 ± 10 μsec

Adjusting method:

1) Release the protect.
   Page: 1, address: 00, data: 01
2) Set data: 0B to page: D, address: 05.
3) Change the data of page: D, address: 05 and minimize "t1". (Coarse adjustment)
4) Change the data of page: D, address: 04, and adjust so that the switching position (t1) becomes the specified value. (Fine adjustment)
5) Press the PAUSE button of the adjusting remote control unit.

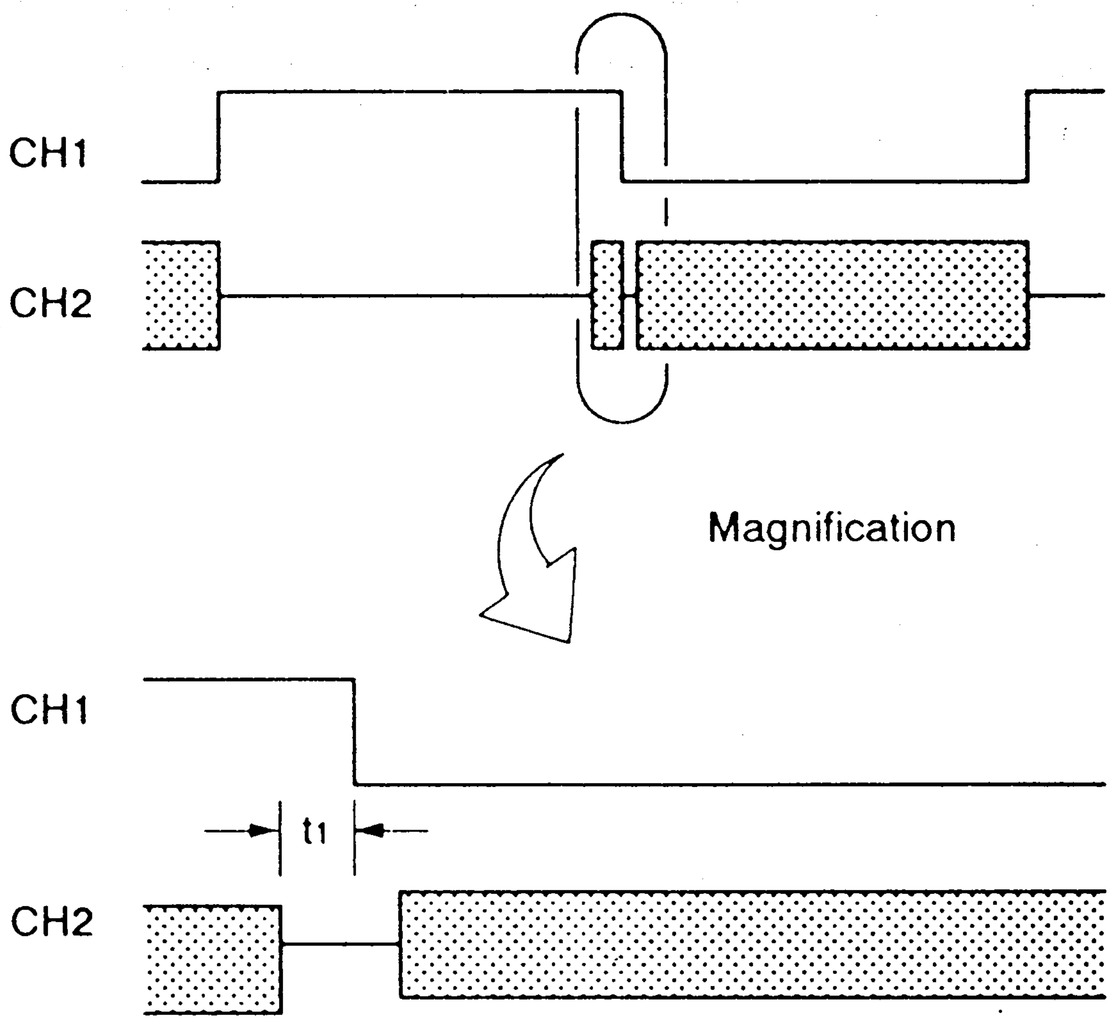


Fig. 9-5.

9-5. VIDEO ADJUSTMENTS

The adjustments of the video system must be performed according to the following adjustment procedure.

The color video signal supplied from the pattern generator is used as the video input signal for adjusting the video system in recording mode. Check that the sync signal and the color burst signal satisfy the specification specified during the adjustment set-up shown in Fig. 9-2.

[Adjusting procedure]

1) Playback frequency characteristic adjustment
2) Flying erase check
3) VXO oscillation frequency check
4) EE level adjustment
5) IR adjustment
6) Chroma comb filter adjustment
7) Emphasis input level adjustment
8) PB Y level adjustment
9) PB LINE OUT level adjustment
10) Y FM carrier frequency adjustment
11) Y FM deviation adjustment
12) Chroma emphasis f0 adjustment
13) REC Y level adjustment
14) REC C RF level adjustment
15) REC ATF level check

1. Playback Frequency Characteristic Adjustment (CS-44 board)

Note: The adjusting element for CH2 is shown in parentheses [ ].

Mode	Playback
Signal	Alignment tape: For frequency characteristic adjustment (WR5-6N)
Measurement Point	CH1: Pin ③ of CN001 EXT TRIG: Pin ④ of CN001
Measuring Instrument	Oscilloscope TRIG SLOPE: +, [–]
Adjustment Page	D
Adjustment Address	43 (MT 1CH) [45 (MT 2CH)]
Specified Value	3.58 MHz level: 5.5 MHz level= 4: (3 ± 0.3)

Adjusting method:

1) Confirm that the EDIT switch is OFF position.
2) Release the protect.
   Page: 1, address: 00, data: 01
3) Change the data of address: 43 [45] of page D, and adjust the level ratio of 3.58 MHz and 5.5 MHz of PB RF output waveform to the specified value.
   Note: After each address adjustment, be sure to press the PAUSE button of the adjusting remote control unit and memorize the data.

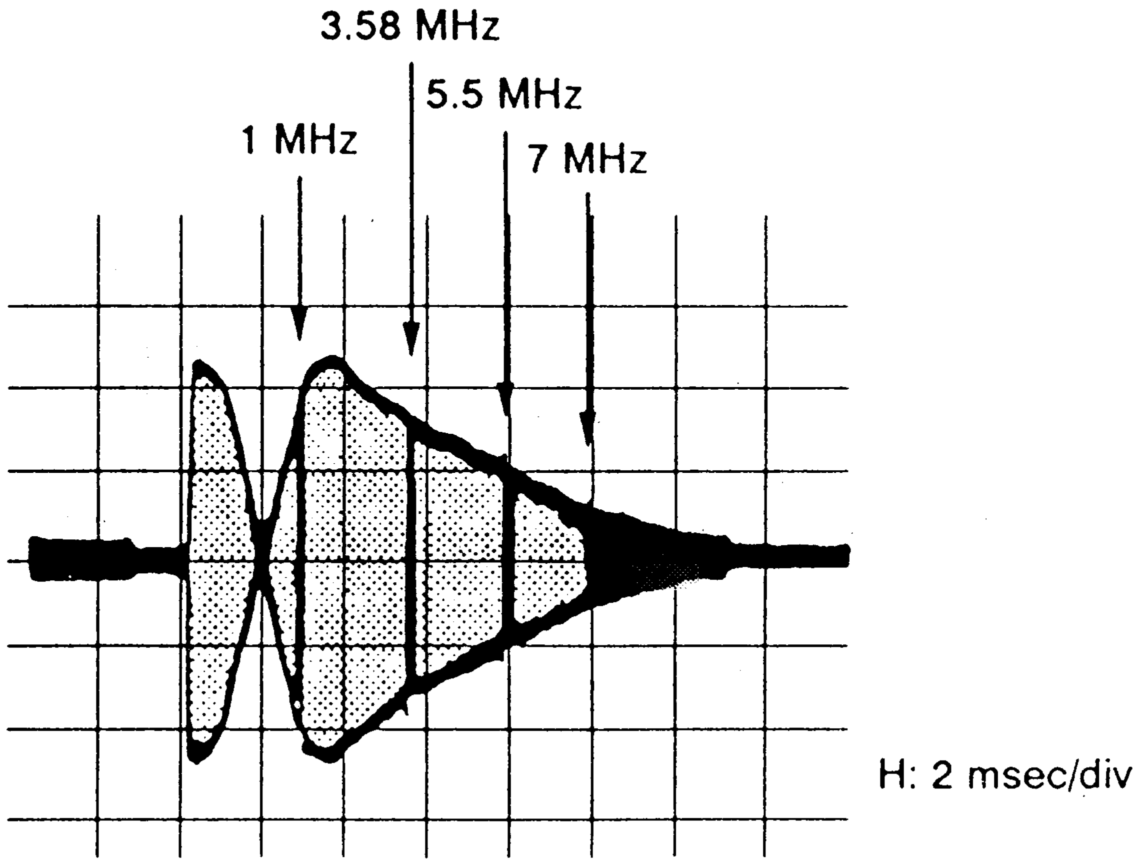


Fig. 9-6.

2. Flying Erase Check (CS-44 board)

Mode	Record
Signal	Arbitrary
Measurement Point	Pin ② of CN002 (FE (X))
Measuring Instrument	Oscilloscope and frequency counter
Specified Value	Frequency: Above 7.5 MHz Voltage: Above 7.0 Vp-p

Note: Use a MP type tape.

Checking method:

1) Check that the oscillation frequency is above 7.5 MHz and that the oscillation voltage is above 7.0 Vp-p.

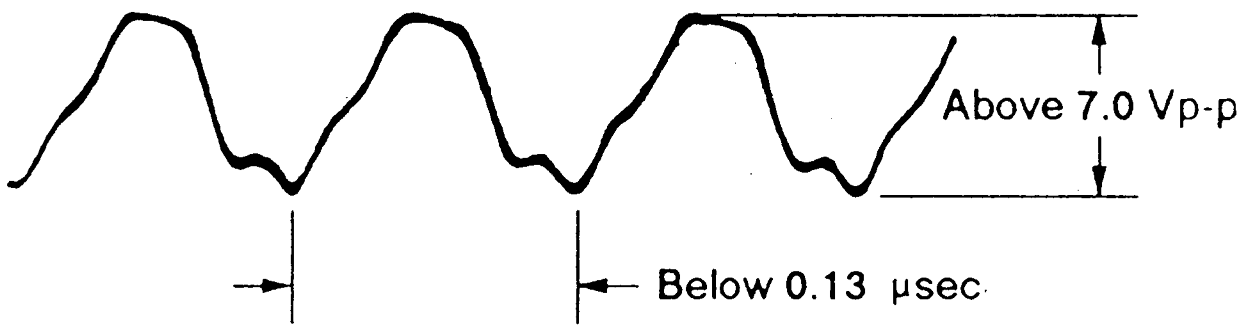


Fig. 9-7.

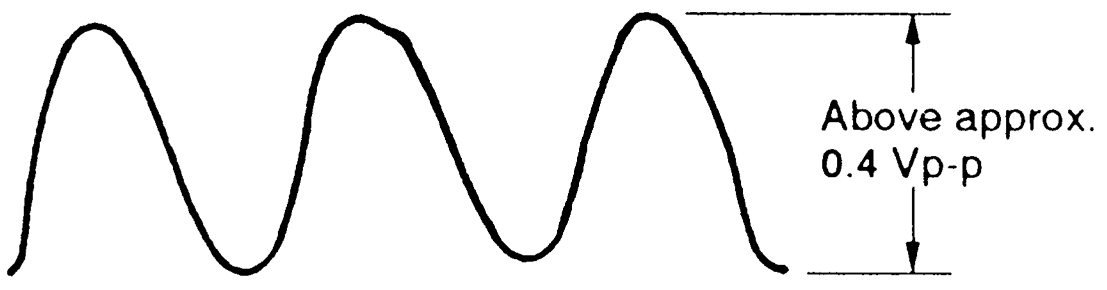
3. VXO Ocillation Frequency Check (VA-83 board)

Mode	Record
Signal	Color bar
Measurement Point	Pin ⑫ of IC301
Measuring Instrument	Frequency counter
Specified Value	3579545 ± 70 Hz

Note: Connect the frequency counter via a high impedance (approximately 10 MΩ) and low capacity (below 10 pF) buffer.

Adjusting method:

1) Check that the oscillation frequency of pin ⑫ of IC301 is 3579545 ± 70 Hz.



(3579545 ± 70Hz)

Fig. 9-8.

4. EE Level Adjustment (VA-83 board)

Mode	E-E
Signal	Color bar
Measurement Point	Pin ⑪ of CN400 (VIDEO OUT)[Note]
Measuring Instrument	Oscilloscope
Adjustment Page	D
Adjustment Address	4A (EE LEVEL)
Specified Value	A=1.00 ± 0.025V

Note: Terminate pin ⑪ of CN400 at 75 Ω.
After completing adjustments, remove the 75 Ω resistor.

Adjusting method:

1) Release the protect.
   Page: 1, address: 00, data: 01
2) Change the data of page: D, address: 4A, and adjust so that the Y signal level (A) becomes the specified value.
3) Press the PAUSE button of the adjusting remote control unit.

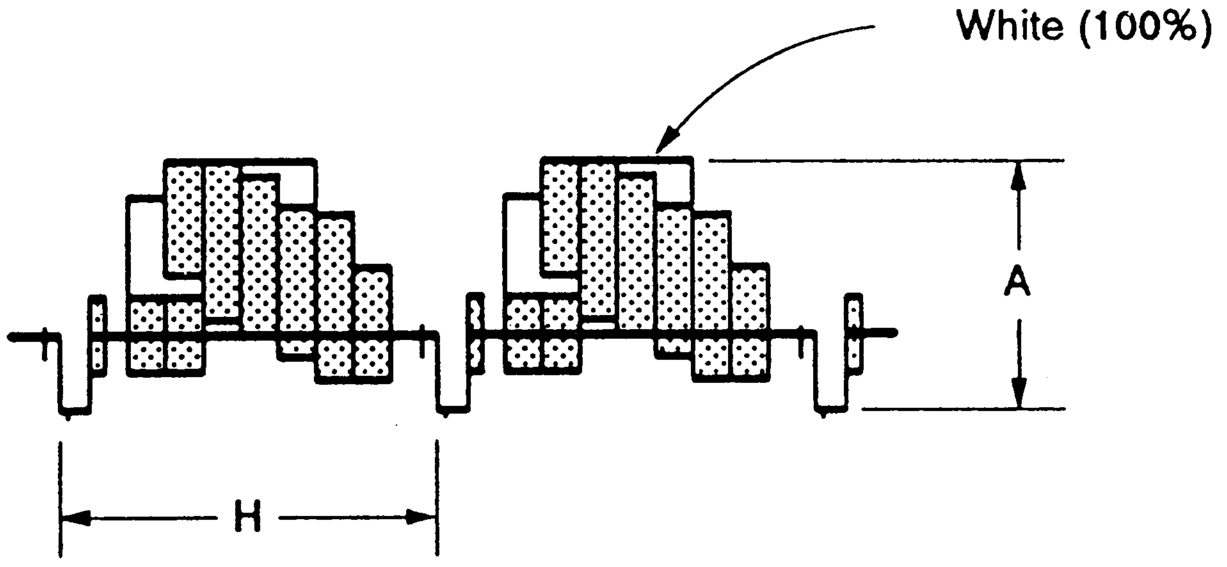


Fig. 9-9.

5. IR Adjustment (VA-83 board)

Mode	E-E
Signal	Color bar
Measurement Point	Pin ⑦ of IC201 (Y COMB OUT)
Measuring Instrument	Oscilloscope
Adjustment Page	D
Adjustment Address	4D (SR IR)
Specified Value	Residual chroma component (A) is minimum (below 50 mVp-p)

Connection

1) Connect pin ⑭ of IC201 (or pin ② of IC205) to pin (51) of IC201 with a jumper wire.

Adjusting method:

1) Release the protect.
   Page: 1, address: 00, data: 01
2) Change the data of page: D, address: 4D, and adjust so that the residual chroma component (A) becomes minimum.
3) Press the PAUSE button of the adjusting remote control unit.

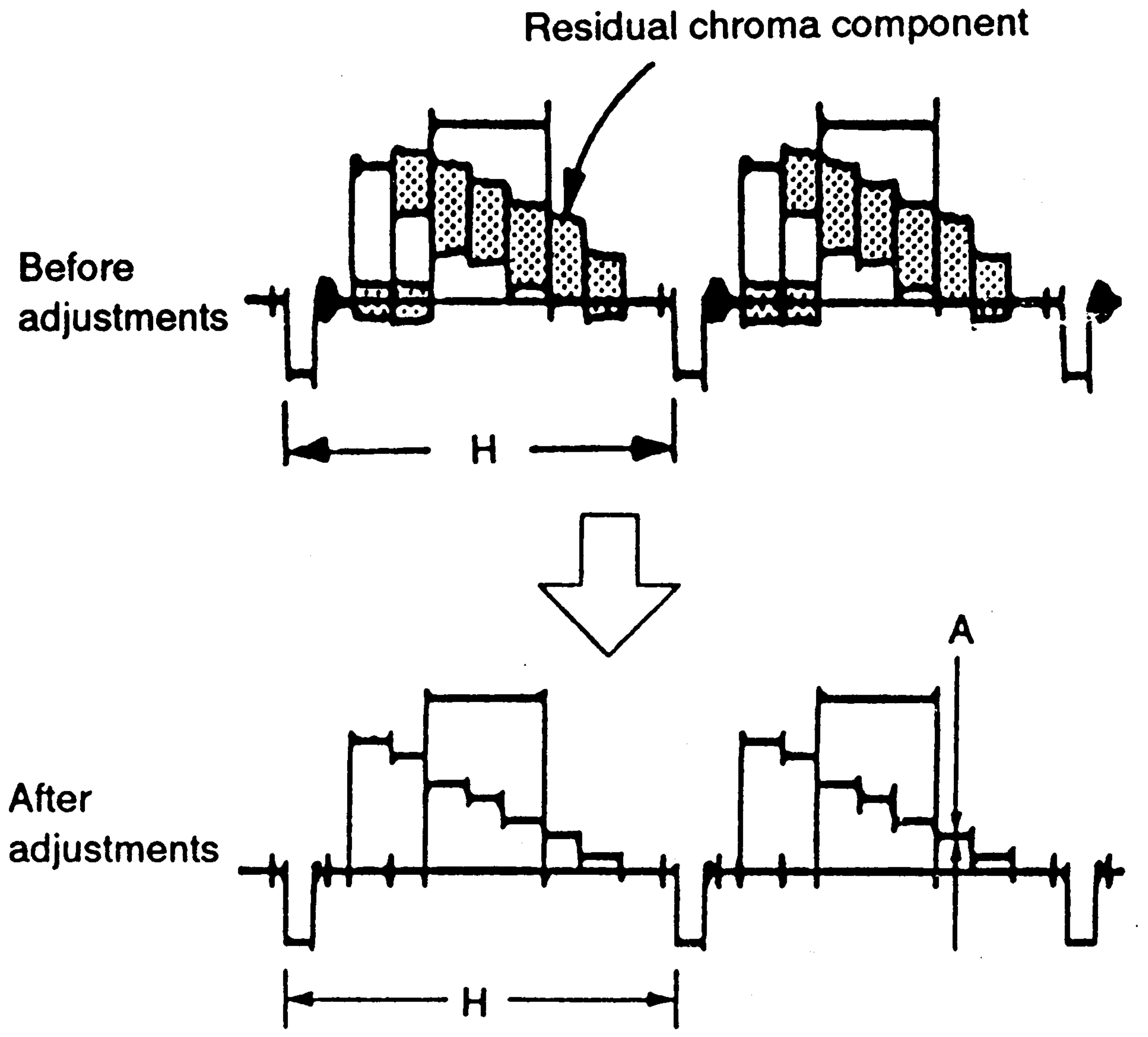


Fig. 9-10.

6. Chroma Comb Filter Adjustment (VA-83 board)

Mode	E-E
Signal	Color bar
Measurement Point	Pin ⑪ of IC201 (C+CD)
Adjusting Element	Oscilloscope
Measuring Instrument	RV051 (Phase)
Adjustment Page	D
Adjustment Address	4C (C COMB)
Specified Value	Residual chroma component (A) is minimum.

Adjusting method:

1) Release the protect.
   Page: 1, address: 00, data: 01
2) Change the data of page: D, address: 4C, and adjust the residual chroma component to minimum.
3) Adjust RV051 so that the residual chroma component (A) becomes minimum.
4) Repeat steps 2) through 3).
5) Press the PAUSE button of the adjusting remote control unit.

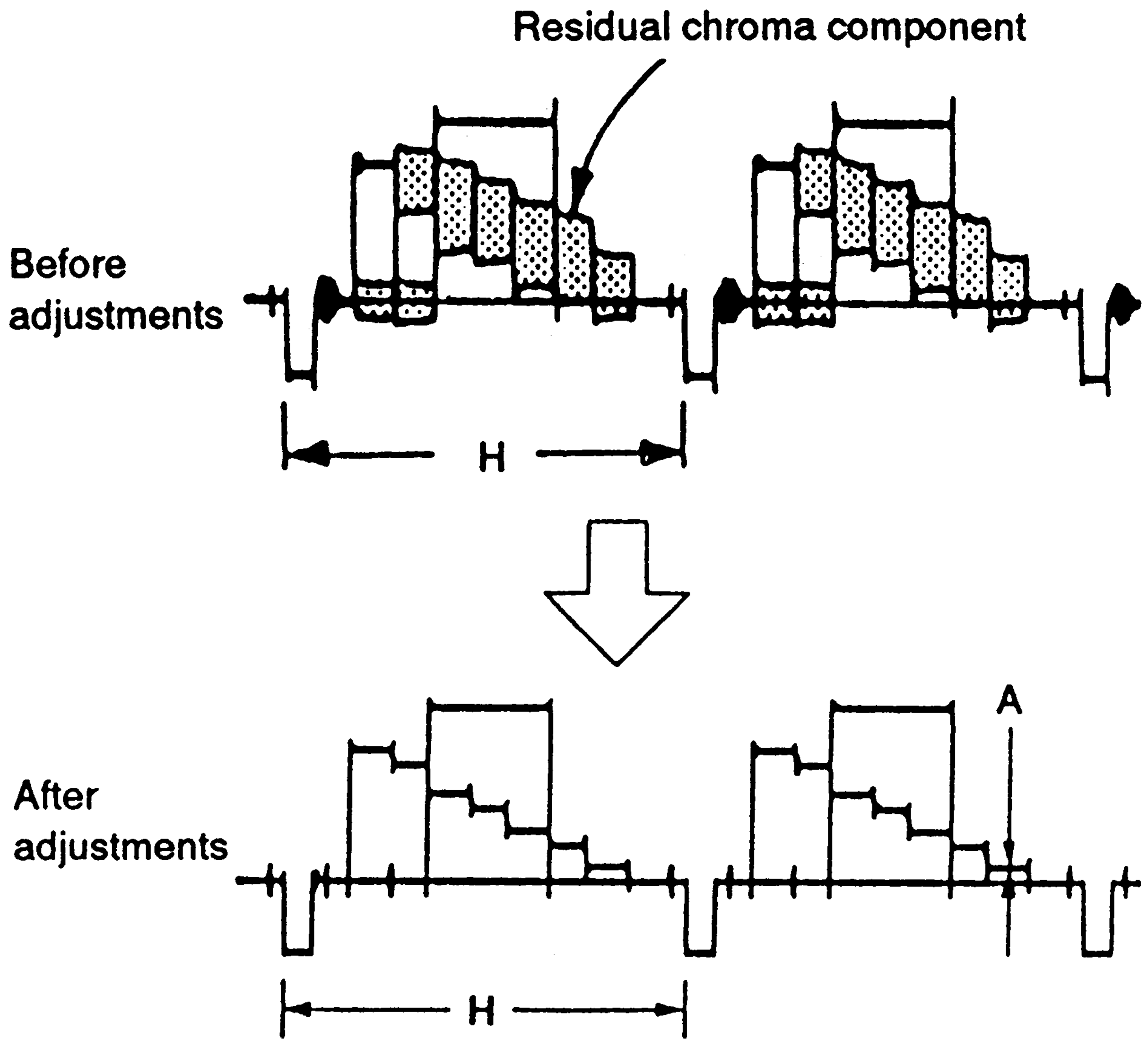


Fig. 9-11.

7. Emphasis input level Adjustment (VA-83 board)

Mode	E-E
Signal	Color bar
Measurement Point	Pin ⑤ of IC206 (or Pin ③ of IC201)
Measuring Instrument	Oscilloscope
Adjustment Page	D
Adjustment Address	5A (EMPH LVL (EE))
Specified Value	A=0.50 ± 0.025V

Adjusting method:

1) Release the protect.
   Page: 1, address: 00, data: 01
2) Change the data of page: D, address: 5A, and adjust so that the Y signal level (A) becomes the specified value.
3) Press the PAUSE button of the adjusting remote control unit.

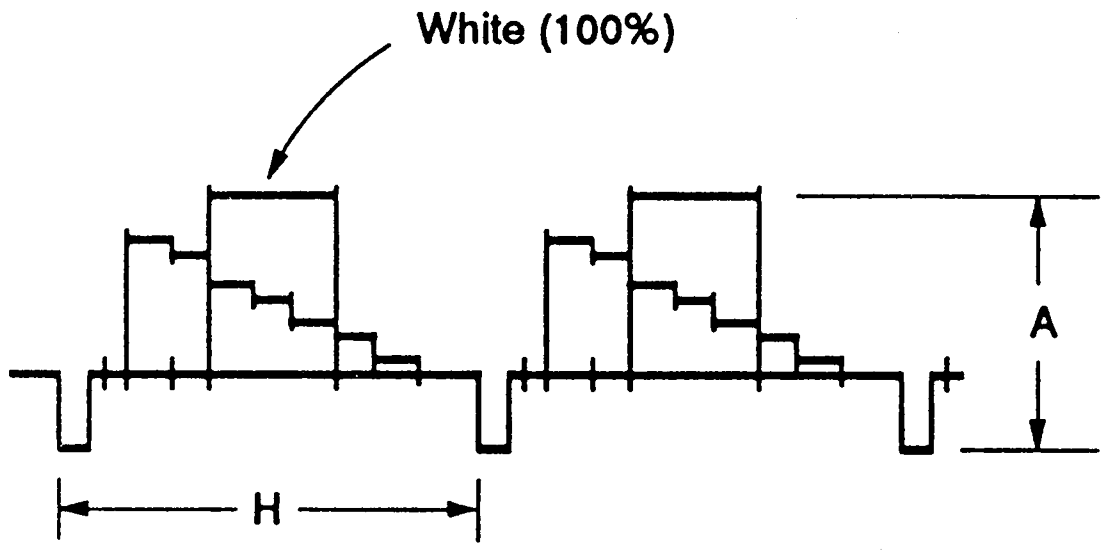


Fig. 9-12.

8. PB Y Level Adjustment (VA-83 board)

Mode	Playback
Signal	Alignment tape: For checking operations (WR5-5NSP) Color bar section
Measurement Point	Pin ㉑ of IC201
Measuring Instrument	Oscilloscope
Adjustment Page	D
Adjustment Address	59 (PB Y (L))
Specified Value	A=0.50 ± 0.025V

Adjusting method:

1) Release the protect.
   Page: 1, address: 00, data: 01
2) Playback the color bar section of the normal mode alignment tape (WR5-5NSP).
3) Change the data of page: D, address: 59, and adjust so that the Y signal level (A) becomes the specified value.
4) Press the PAUSE button of the adjusting remote control unit.

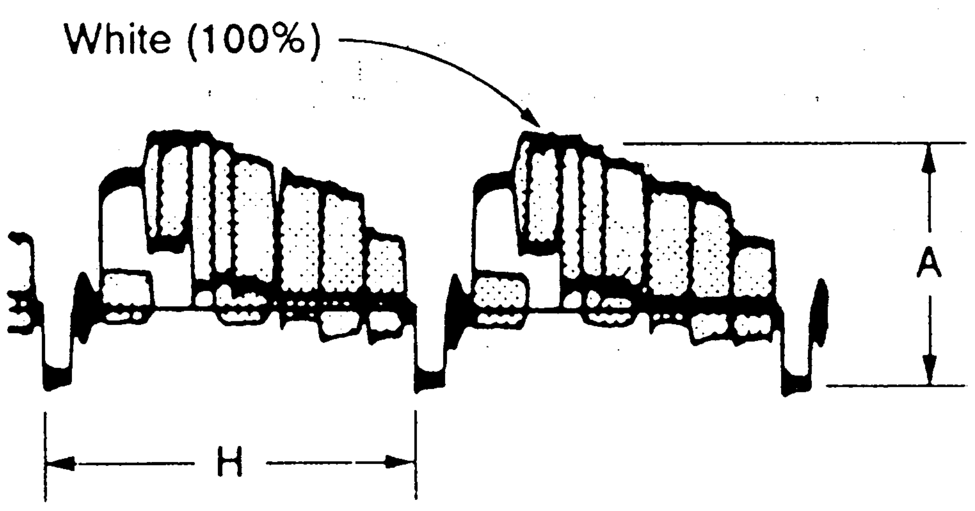


Fig. 9-13.

9. PB LINE OUT Level Adjustment

Mode	Playback
Signal	Alignment tape: For checking operations (WR5-5NSP) Color bar section
Measurement Point	Video output terminal (terminated at 75 Ω)
Measuring Instrument	Oscilloscope
Adjustment Page	D
Adjustment Address	5B (EMPH LVL (PB))
Specified Value	A=1.0 ± 0.05V

Adjusting method:

1) Release the protect.
   Page: 1, address: 00, data: 01
2) Change the data of page: D, address: 5B, and adjust so that the video signal level (A) becomes the specified value.
3) Press the PAUSE button of the adjusting remote control unit.

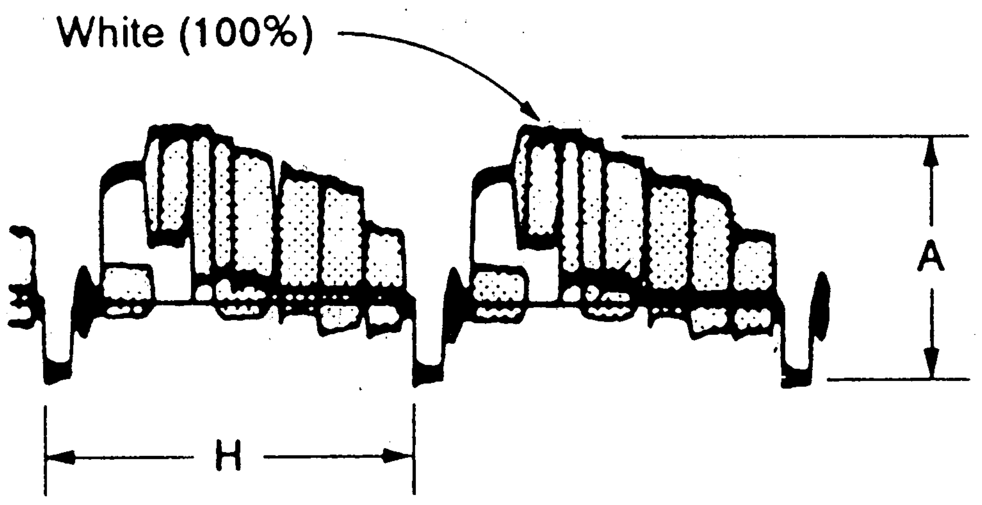


Fig. 9-14

10. Y FM Carrier Frequency Adjustment (VA-83 board)

Mode	E-E
Signal	No signal
Measurement Point	Pin ㊸ of IC201 (Y RF OUT)
Measuring Instrument	Frequency counter
Adjustment Page	D
Adjustment Address	4F (Y FM CARRIER)
Specified Value	4.38 ± 0.04 MHz

Adjusting method:

1) Release the protect.
   Page: 1, address: 00, data: 01
2) Change the data of page: D, address: 4F, and adjust so that the Y FM carrier frequency becomes the specified value.
3) Press the PAUSE button of the adjusting remote control unit.
4) Perform "Deviation Adjustment".

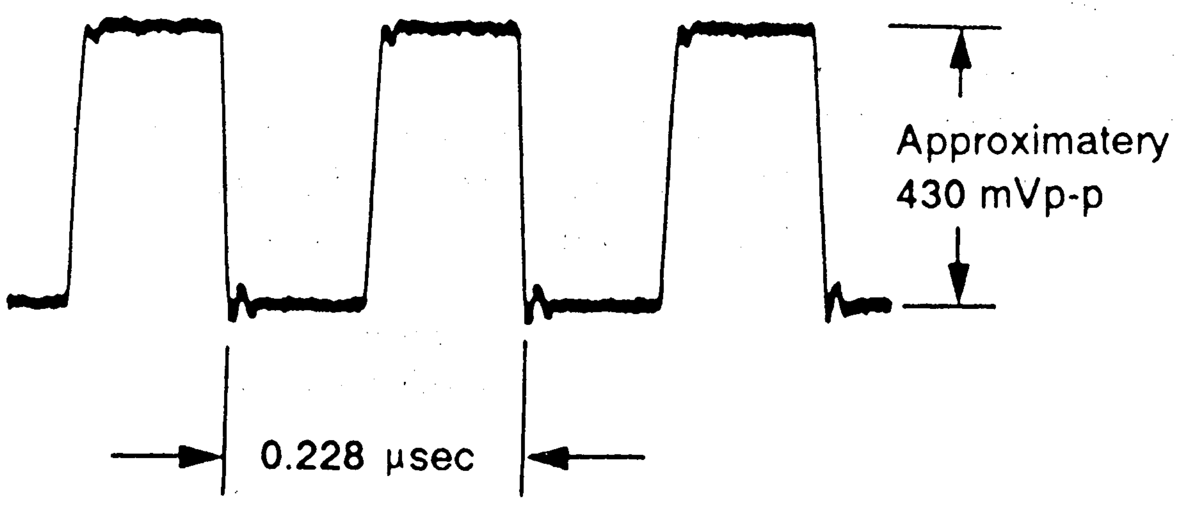


Fig. 9-15.

11. Deviation Adjustment (VA-83 board)

Mode	Record and playback
Signal	Color bar
Measurement Point	Pin ㉑ of IC201
Measuring Instrument	Oscilloscope
Adjustment Page	D
Adjustment Address	51 (Y FM DEVIATION)
Specified Value	A=0.50 ± 0.025V

Note: Check that "Emphasis Input Level Adjustment", "PB Y Level Adjustment" and "Y FM Carrier Frequency Adjustment" have been completed.

Adjusting method:

1) Release the protect.
   Page: 1, address: 00, data: 01
2) Record the color bar signal.
3) Playback the recorded signal.
4) Check the playback signal level (A).
   Specification:A=0.50 ± 0.025V
5) If the specification is not satisfied, change the data of page: D, address: 51, and repeat steps 2 to 4.

Playback signal level	Changing the data
When smaller than the specified value	Increase
When bigger than the specified value	Decrease

6) Press the PAUSE button of the adjusting remote control unit.

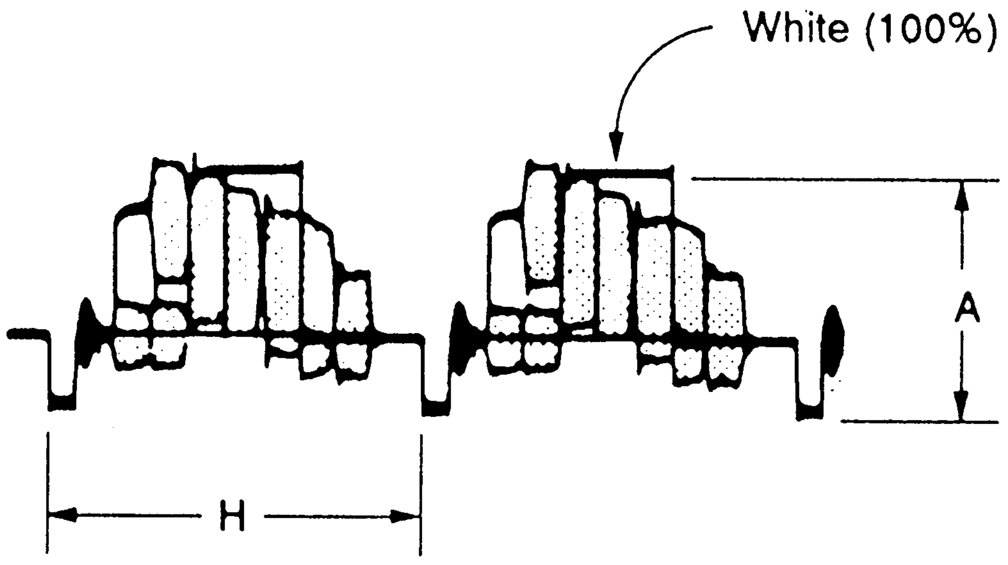


Fig. 9-16.

12. Chroma Emphasis fo Adjustment (VA-83 board)

Mode	Record
Signal	Color bar
Measurement Point	Pin ㉔ of IC203
Measuring Instrument	Oscilloscope
Adjustment Element	FL302
Specified Value	Minimum fo component

Adjusting method

1) Adjust FL203 so that the amplitude of the latter section of the chroma signal (yellow section) becomes minimum.

Minimize the amplitude of the latter section of the yellow section.

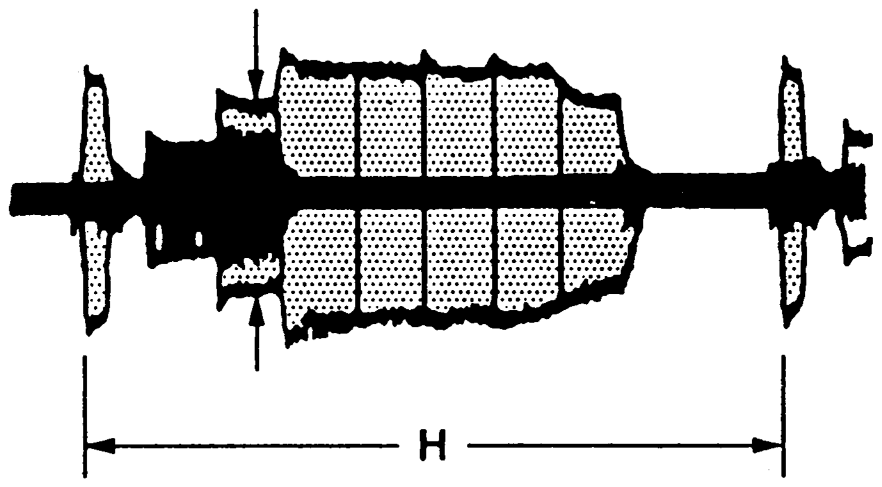


Fig. 9-17.

13. REC Y Level Adjustment (VA-83 board)

Mode	E-E
Signal	No signal
Measurement Point	Pin ⑤ of IC054
Measuring Instrument	Oscilloscope
Adjustment Page	D
Adjustment Address	55 (REC (MP)), 54 (REC Y (ME))
Specified Value	MP type tape: A=210 ± 5 mVp-p ME type tape: A=185 ± 5 mVp-p

Adjusting method:

1) Release the protect.
   Page: 1, address: 00, data: 01
2) Insert a MP type cassette tape.
3) Change the data of page: D, address: 55, and adjust so that the Y signal level (A) becomes the specified value.
4) Press the PAUSE button of the adjusting remote control unit.
5) Insert a ME type cassette tape.
6) Change the data of page: D, address: 54, and adjust so that the Y signal level (A) becames the specified value.
7) Press the PAUSE button of the remote control unit.

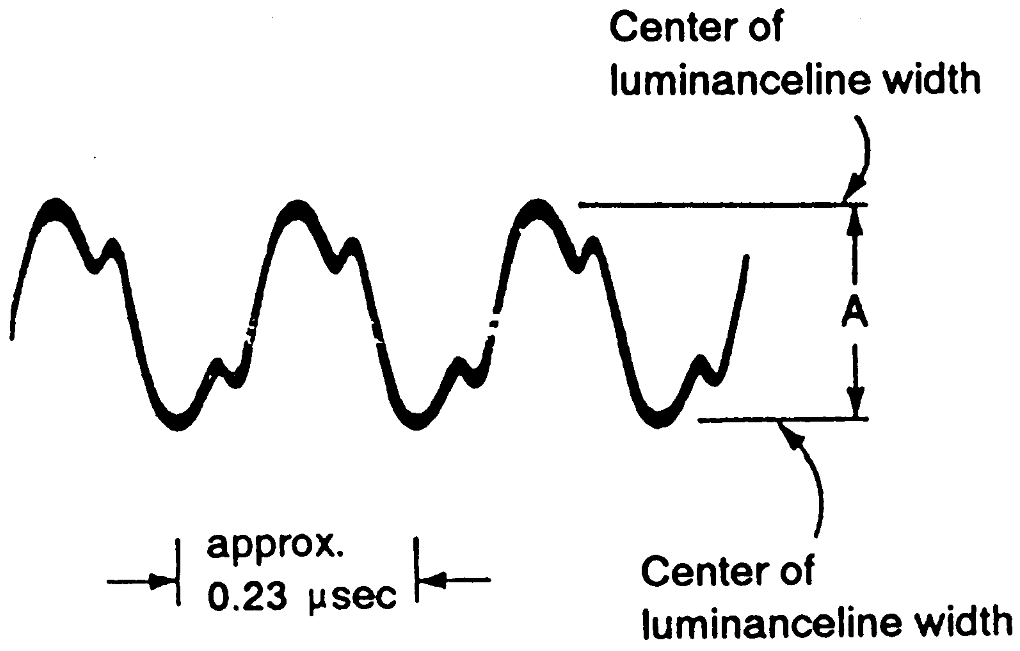


Fig. 9-18.

14. REC C RF Level Adjustment (VA-83 board)

Mode	E-E
Signal	Color bar
Measurement Point	Pin ③ of IC054
Measuring Instrument	Oscilloscope
Adjustment Page	D
Adjustment Address	46 (REC C RF (EE))
Specified Value	A=135 ± 10 mVp-p

Note: Use a MP type tape.

Adjusting method

1) Release the protect.
   Page: 1, address: 00, data: 01
2) Change the data of page: D, address: 46, and adjust so that the chroma signal level (A) becames the specified value.
3) Press the PAUSE button of the adjusting remote control unit.
4) Set data: 00 to page: D, address: 47, and press the PAUSE button of the adjusting remote control unit.

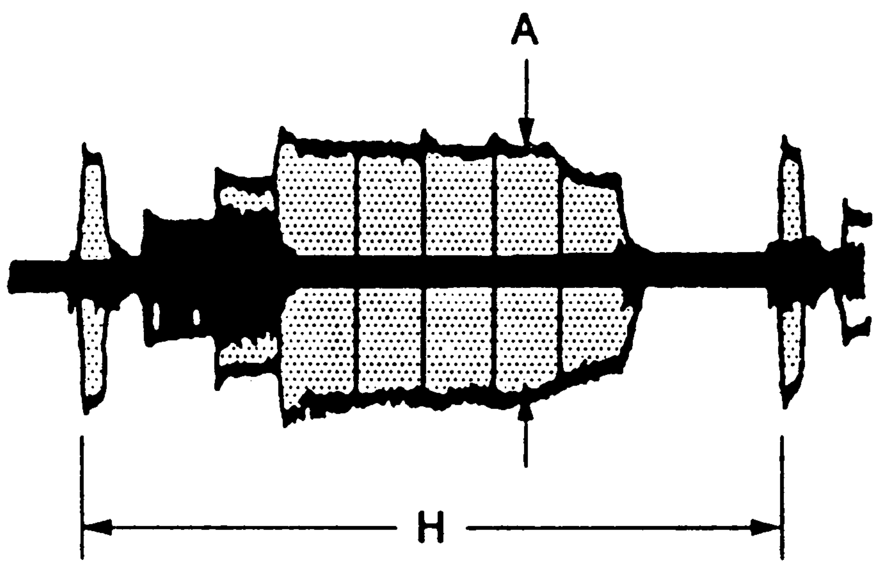


Fig. 9-19.

15. REC ATF Level Checking (CS-44 board)

Mode	Record
Signal	No signal
Measurement Point	Pin ⑱ of IC501
Measuring Instrument	Oscilloscope
Specified Value	A=600 ± 30 mVp-p

Checking method

1) Confirm that the REC ATF signal level (A) satisfies the specified value.

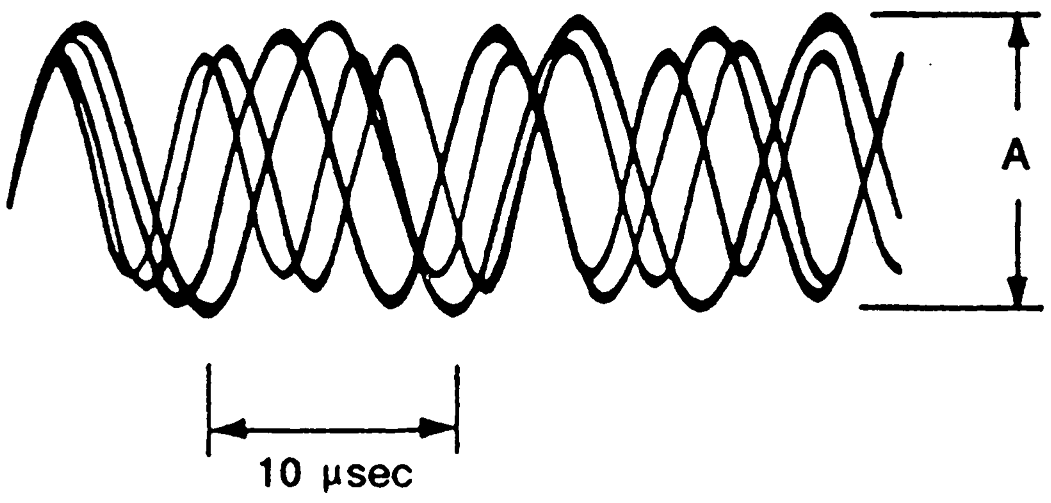


Fig. 9-20.

9-6. AUDIO SYSTEM ADJUSTMENT

- Perform the adjustment using the color bar signal as a video signal input.

[Connecting the measuring instruments for the audio]

Connect the audio system measuring instruments besides the video system measuring instruments as shown in Fig. 9-21, and perform adjustments with the power switch [video] position.
Switch the input/output switchover switch in accordance with the mode as follows.

- Input position·······Recording mode
- Output position·····Playback mode

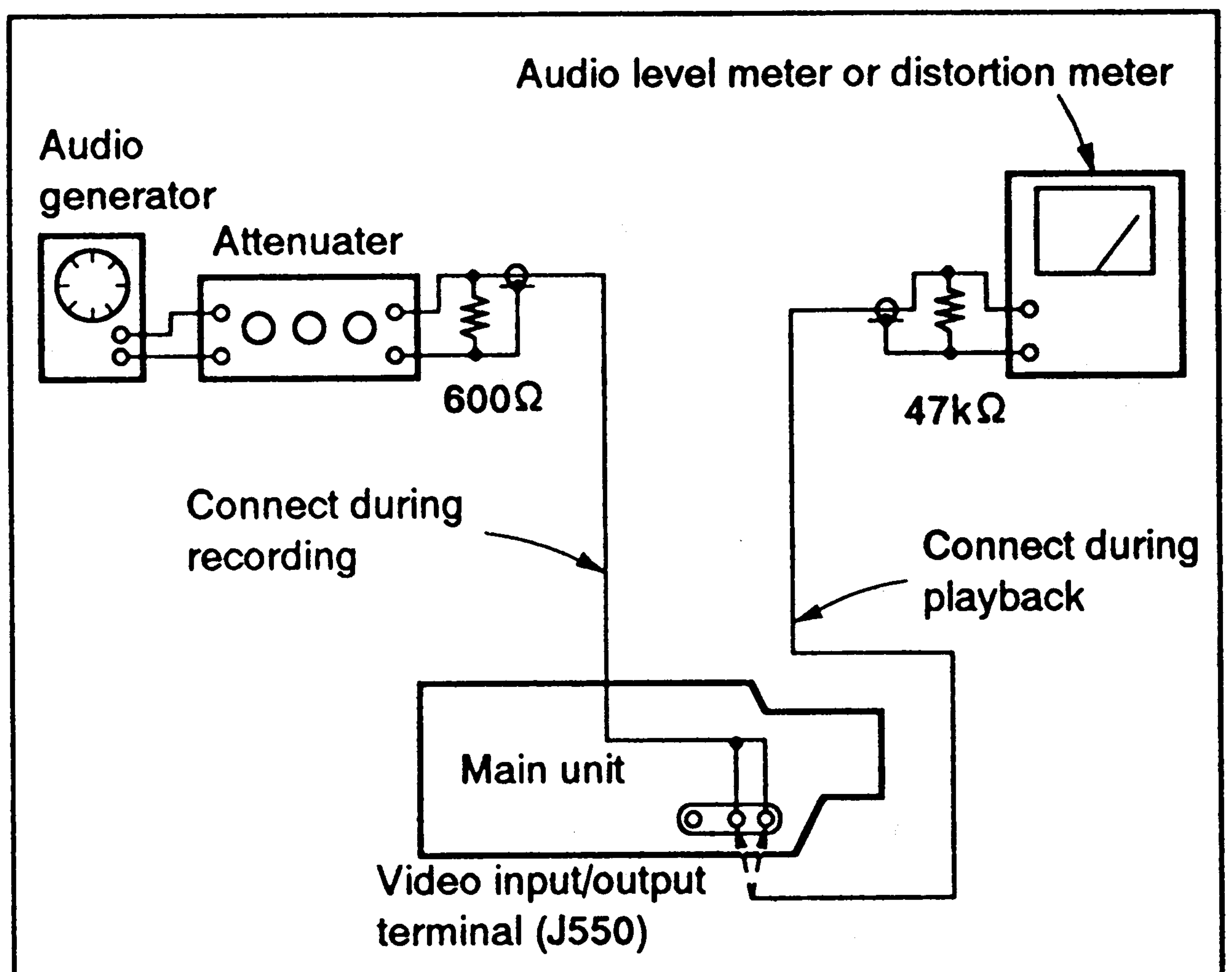
Adjust the HI-FI SOUND switch (PF-47 board S552) to the following position unless specified otherwise.

- Green (stereo) position

Note: 1) When inputting the audio signal, input the same signal to both L, and R channels, unless specified otherwise.

2) Be sure to insert the plug (shorting plug or dummy plug, etc.) into the audio input/output terminal (right). If the plug is not inserted, the unit will be set into the monaural mode, and correct adjustments cannot be carried out.
(Monaural mode)
During recording··REC AFM RF1.7 MHz carrier will not be output.
During playback·· The L+R signal will be output from the audio input/output terminal (left).

3) The items to be adjusted for the R channel will be indicated within the [ ], in regard to the adjusting items to be adjusted for both L and R channels.


Audio level meter or distortion meter
Audio generator
Attenuater
600Ω
47kΩ
Connect during recording
Connect during playback
Main unit
Video input/output terminal (J550)

When connecting the input/output equipment simultaneously, adjust the input/output switchover switch to the [input] position, and connect the audio oscillator/attenuater to the audio input/output terminal.
Connect the audio level meter or the distortion meter as shown in the following figure.

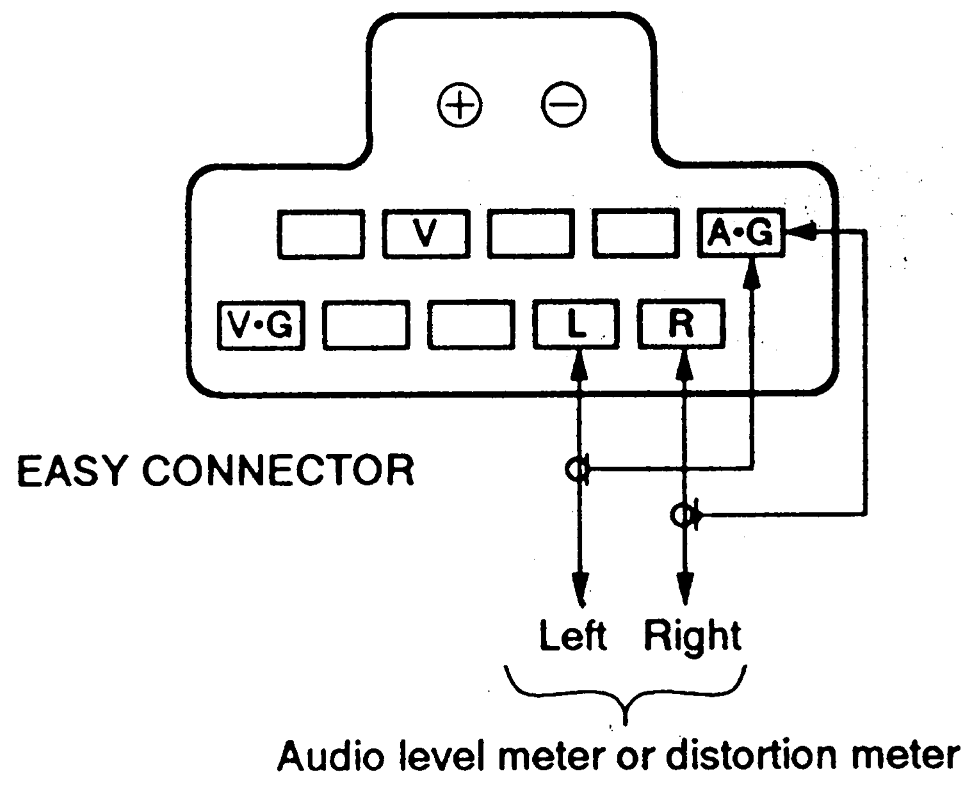

⊕ ⊖
V
A·G
V·G
L
R
EASY CONNECTOR
Left
Right
Audio level meter or distortion meter

Fig. 9-21.

[Adjustment Procedure]

1) 1.5 MHz carrier frequency check
2) 1.7 MHz carrier frequency check
3) 1.5 MHz recording level check
4) 1.7 MHz recording level check
5) E-E output level check
6) REC matrix L–R check
7) REC matrix L+R check
8) IR adjustment
9) 1.5 MHz deviation adjustment
10) 1.7 MHz deviation adjustment
11) PB matrix L adjustment
12) PB matrix R check
13) Overall level characteristics, distortion check
14) Separation check
15) Overall noise level check

1. 1.5 MHz Carrier Frequency Check (VA-83 board)

Mode	Record
Signal	No signal
Measurement Point	Pin ⑧ of IC401
Measuring Instrument	Frequency counter (Note 1)
Specified Value	1.500 ± 0.002 MHz

Note: Use a high impedance (above 1 MΩ) and low capacity (below 20 pF) probe.

Checking method:

1) Check that the 1.5 MHz carrier frequency satisfies the specified value.

2. 1.7 MHz Carrier Frequency Check (VA-83 board)

Mode	Record
Signal	No signal
Measurement Point	Pin ⑧ of IC400
Measuring Instrument	Frequency counter (Note 1)
Specified Value	1.700 ± 0.002 MHz

Note: 1) Use a high impedance (above 1 MΩ) and low capacity (below 20 pF) probe.
2) Insert a shorting plug into the audio input terminal (right).

Checking method:

1) Check that the 1.7 MHz carrier frequency satisfies the specified value.

3. 1.5 MHz Record Level Check (VA-83 board)

Mode	Record (Monaural)
Signal	No signal
Measurement Point	Pin ⑤ of CN202 (REC AFM RF)
Measuring Instrument	Oscilloscope
Specified Value	A=110 ± 12 mVp-p

Note: Do not insert the plug into the audio input terminal (right).

Checking method:

1) Check that the 1.5 MHz carrier level satisfies the specified value.
(Read the center of the luminance line width and note down the level read.)

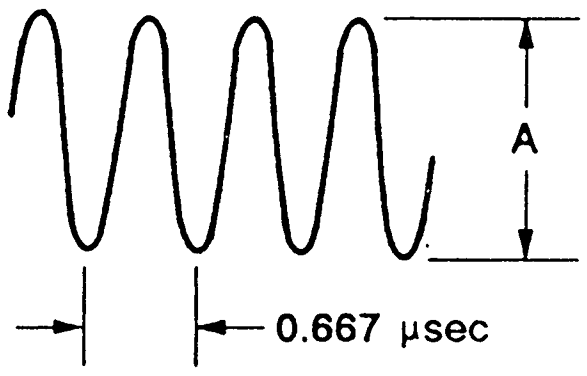


Fig. 9-22.

4. 1.7 MHz Record Level Check (VA-83 board)

Mode	Record
Signal	No signal
Measurement Point	Pin ⑤ of CN202 (REC AFM RF)
Measuring Instrument	Oscilloscope
Specified Value	A=200 ± 20 mVp-p

Note: Insert a shorting plug into the audio input terminal (right).

Checking method:

1) Check that the REC AFM RF level (A) satisfies the specified value.

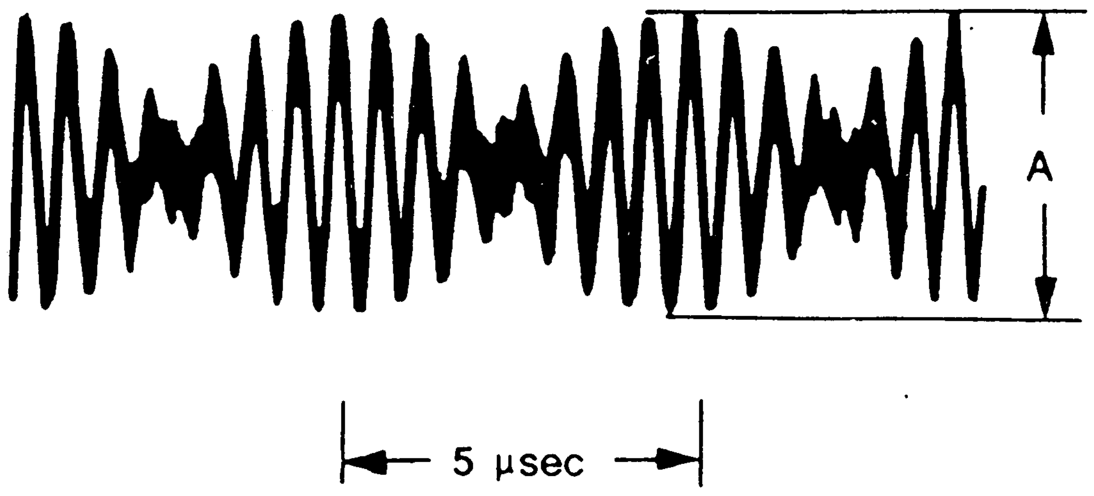


Fig. 9-23.

5. E-E Output Level Check (VA-83 board)

Mode	Record
Signal	400 Hz, –7.5 dBs audio input terminal right [left]
Measurement Point	Terminal L [R] of EASY CONNECTOR
Measuring Instrument	Oscilloscope
Specified Value	925^{+240}_{-190} mVp-p (–7.5 ± 2 dBs)

Checking method:

1) Check that the 400 Hz signal level satisfies the specified value.

6. REC Matrix L-R Adjustment (VA-83 board)

Mode	Record
Signal	400 Hz, –7.5 dBs Input to both left and right terminals of the audio input terminal
Measurement Point	Pin ③ of IC402
Measuring Instrument	Oscilloscope (Use 1:1 probe)
Adjustment Page	D
Adjustment Address	78 (REC MATRIX)
Specified Value	0 ± 5 mVp-p

Adjusting method:

1) Release the protect.
   Page: 1, address: 00, data: 01
2) Change the data of page: D, address: 78, and minimize the 400 Hz signal level.
3) Press the PAUSE button of the adjusting remote control unit.

7. REC Matrix L+R Check (VA-83 board)

Mode	Record
Signal	1. 400 Hz, –7.5 dBs: Audio input terminal left No signal: Audio input terminal right 2. No signal: Audio input terminal left 400 Hz, –7.5 dBs: Audio input terminal right
Measurement Point	Pin ㉕ of IC402
Measuring Instrument	Oscilloscope
Specified Value	The level difference is 0 ± 10 mVp-p when only the left terminal is input and when only the right terminal is input.

Note: When measuring the signal level of pin ㉕ of IC402, wait for more than 1 minute after signal input before measuring. (To stabilize the AGC)

Adjusting method:

1) Input the 400 Hz, –7.5 dBs signal only to the audio input terminal (left). (Insert the shorting plug to the audio input terminal (right).)
2) Read the 400 Hz signal level of pin ㉕ of IC402, and take it down. (Approximately 200 mVp-p)
3) Input the 400 Hz, –7.5 dBs signal only to the audio input terminal (right). (Insert the shorting plug to the audio input terminal (left).)
4) Check that the 400 Hz signal level of pin ㉕ of IC402 is (the value that was taken down at step 2) ± 10 mVp-p.

8. IR Adjustment (VA-83 board)

Mode	Playback
Signal	Alignment tape: AFM stereo For checking operations (WR5-9NS)
Measurement Point	Pins ㊹ and ⑥ of IC401 (1.5 IR) Pins ㊹ and ⑥ of IC400 (1.7 IR)
Measuring Instrument	Digital voltmeter
Adjustment Page	D
Adjustment Address	7A (1.5 IR), 7C (1.7 IR)
Specified Value	The DC voltage difference between pins ㊹ and ⑥ is 0 ± 10 mVdc

Adjusting method:

1) Release the protect.
   Page: 1, address: 00, data: 01
- 1.5 IR adjustment
2) Connect the digital voltmeter to pin ㊹ of IC401, and read the voltage. (Approximately 2100 mVdc)
3) Connect the digital voltmeter to pin ⑥ of IC401.
4) Change the data of page: D, address: 7A, and adjust so that the voltage of pin ⑥ of IC601 becomes equal to the voltage of pin ㊹. (Voltage difference below 10 mVdc)
5) Press the PAUSE button of the adjusting remote control unit.
- 1.7 IR adjustment
6) Connect the digital voltmeter to pin ㊹ of IC400, and read the voltage. (Approximately 2100 mVdc)
7) Connect the digital voltmeter to pin ⑥ of IC400.
8) Change the data of page: D, address: 7C, and adjust so that the voltage of pin ⑥ of IC400 becomes equal to the voltage of pin ㊹. (Voltage difference below 10 mVdc)
9) Press the PAUSE button of the adjusting remote control unit.

9. 1.5 MHz Deviation Adjustment

Mode	Playback
Signal	Alignment tape: For checking the operation (WR5-5NSP)
Measurement Point	Audio output terminal left or right
Measuring Instrument	Oscilloscope
Adjustment Page	D
Adjustment Address	7B (1.5 DEV)
Specified Value	-7.5 ± 0.5 dBs

Adjusting method:

1) Release the protect.
   Page: 1, address: 00, data: 01
2) Change the data of page: D, address: 7B, and adjust so that the 400 Hz signal level becomes the specified value.
3) Press the PAUSE button of the adjusting remote control unit.

10. 1.7MHz Deviation Adjustment (VA-83 board)

Mode	Playback
Signal	Alignment tape: AFM stereo For checking operations (WR5-9NS) Bilingual (Monoscope) section
Measurement Point	1. Pin ㉗ of IC402 2. Pin ① of IC402
Measuring Instrument	Oscilloscope
Adjustment Page	D
Adjustment Address	7D (1.7 DEV)
Specified Value	8 ± 0.05 graduation

Adjusting method:

1) Release the protect.
   Page: 1, address: 00, data: 01
2) Connect the oscilloscope to pin ㉗ of IC402.
3) Adjust the 400 Hz signal amplitude to the 8.0 graduation using the VOLT/DIV knob of the oscilloscope.
4) Connect the oscilloscope to pin ① of IC402.
5) Change the data of page: D, address: 7D, and adjust so that the 1 kHz signal level becomes 8 ± 0.05 graduation. (Adjust with the center of the luminance line width.)
6) Press the PAUSE button of the adjusting remote control unit.

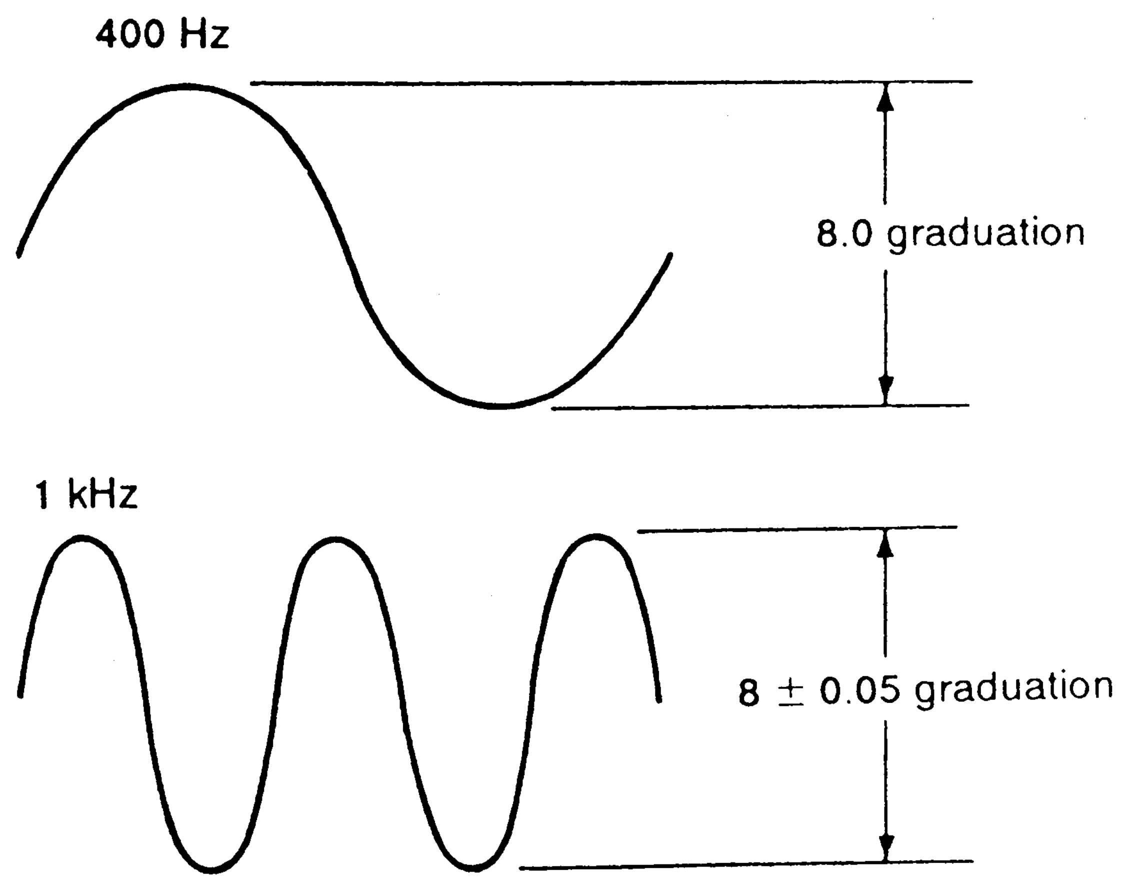


Fig. 9-24.

11. PB Matrix L Adjustment (VA-83 board)

Mode	Self recording/playback
Signal	No signal: Audio input terminal (left) 400 Hz, –7.5 dBs: Audio input terminal (right)
Measurement Point	Terminal L of EASY CONNECTOR
Measuring Instrument	Oscilloscope
Adjustment Page	D
Adjustment Address	79 (PB MATRIX)
Specified Value	Below 20 mVp-p

Adjusting method:

1) Release the protect.
   Page: 1, address: 00, data: 01
2) Input the 400 Hz, –7.5 dBs signal only to the audio input terminal (right). (Insert the shorting plug to the audio input terminal (left).)
3) Record.
4) Remove the input signal.
5) Playback the recorded section.
6) Change the data of page: D, address: 79, and minimize the cross talk component (400 Hz).
7) Press the PAUSE button of the adjusting remote control unit.

12. PB Matrix R Check (VA-83 board)

Mode	Self recording/playback
Signal	400 Hz, –7.5 dBs: Audio input terminal (left) No signal: Audio input terminal (right)
Measurement Point	Terminal R of EASY CONNECTOR
Measuring Instrument	Oscilloscope
Specified Value	Below 30 mVp-p

Checking method:

1) Input the 400 Hz, –7.5 dBs signal only to the audio input terminal (left). (Insert the shorting plug to the audio input terminal (right).)
2) Record.
3) Remove the input signal.
4) Playback the recorded section.
5) Check that the cross talk component (400 Hz) is below 30 mVp-p.

13. Overall Level Characteristic, Distortion Check

Mode	Self recording/playback
Signal	400 Hz, –7.5 dBs: Audio input terminal (left) [right] No signal: Audio input terminal (right) [left]
Measurement Point	Audio output terminal (left) [right] or Terminal L [R] of EASY CONNECTOR
Measuring Instrument	Audio level meter and distortion meter
Specified Value	Level: –7.5 ± 2 dBs Distortion rate: Below 0.8% (Note 2)

Note: 1) The [ ] indicates the measuring point during the right channel check
2) Value when the following filter is used

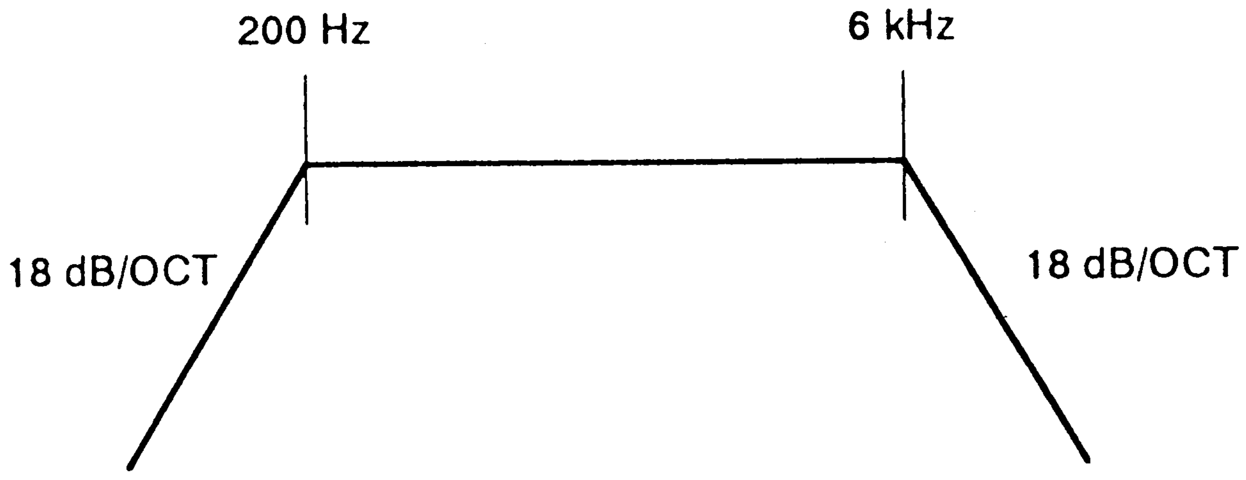


Fig. 9-25.

Checking method:

1) Input the 400 Hz, –7.5 dBs signal only to the audio input terminal (left) [right].
   Note: Be sure to insert the shorting plug to the terminal that was not signal input.
2) Record the signal.
3) Remove the input signal, and adjust the input/output switchover switch to [out].
4) Playback the recorded section.
5) Check that the 400 Hz signal level of the audio output terminal (left) [right] is –7.5 ± 2 dBs, and that the distortion rate is below 0.8% (Note 2).

14. Separation Check

Mode	Self recording /playback
Signal	No signal: Audio input terminal (left) [right] 1 kHz, –7.5 dBs: Audio input terminal (right) [left]
Measurement Point	Audio output terminal (left) [right] or Terminal L [R] of EASY CONNECTOR
Measuring Instrument	Audio level meter (Use an IHF-A curve audio correction filter)
Specified Value	Below –27.5 dBs

Note: The [ ] indicates the measuring point during the right channel check.

Checking method:
1) Insert a shorting plug into the audio input terminal (left) [right], and input a 1kHz, –7.5 dBs signal only to the audio input terminal (right) [left].
2) Record the signal.
3) Remove the input signal, and adjust the input/output switchover switch to [out].
4) Playback the recorded section.
5) Check that the cross talk level (1 kHz) of the audio output terminal (left) [right] is below –27.5 dBs.

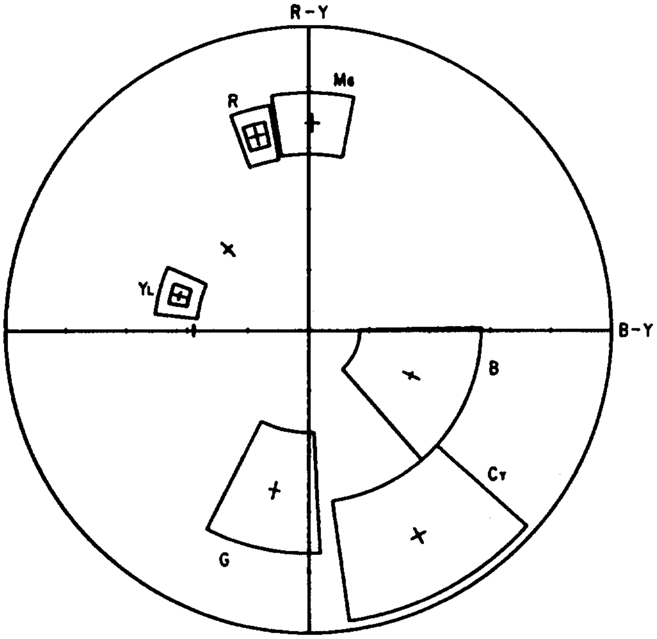
15. Overall Noise Level Check

Mode	Self recording
Signal	No signal: Audio output terminal left and right
Measurement Point	Audio output terminal (left) [right] or Terminal L [R] of EASY CONNECTOR
Measuring Instrument	Audio level meter (Use an IHF-A curve auditory correction filter)
Specified Value	Below –61.0 dBs

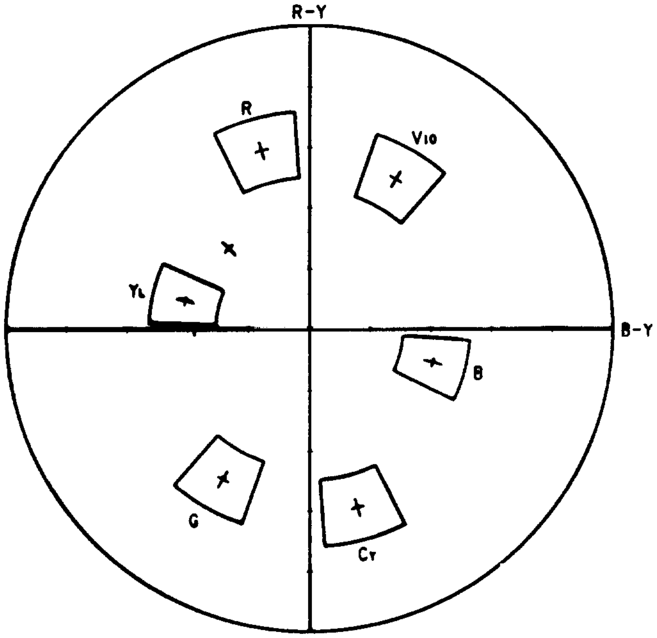
Note: The [ ] indicates the measuring point during the right channel check.

Checking method:
1) Insert the shorting plug to both left and right of the audio input terminals.
2) Record.
3) Remove the shorting plug, and adjust the input/output switchover switch to [out].
4) Playback the recorded section.
5) Check that the noise level of the audio output terminal (left) [right] is below –61.0 dBs.

FOR CAMERA COLOR REPRODUCTION ADJUSTMENT


R-Y
Mg
R
YL
B-Y
B
CY
G

FOR TITLER COLOR REPRODUCTION ADJUSTMENT


R-Y
R
V10
YL
B-Y
B
G
CY

9-973-382-11

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Personal Video Group

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Published by CV Quality Engineering DIV.

CCD-FX500E
RMT-509

SERVICE MANUAL

AEP Model
UK Model
E Model
Australian Model

Remote commander is available as a unit, but as individual parts the battery case lid of commander is only avaiable.

Video8
Handycam

A MECHANISM

For MECHANISM ADJUSTMENTS, refer to the "8 mm Video MECHANICAL ADJUSTMENT MANUAL IV" (9-973-199-11).

SPECIFICATIONS

System

Video recording system	Rotary two heads, Helical scanning FM system
Audio recording system	Rotary head, FM system
Video signal	PAL color, CCIR standards
Cassette type	8 mm video format cassette
Tape speed	SP mode: Approx. 2.0051 cm/sec. LP mode: Approx. 1.0058 cm/sec.
Recording/Playback time	SP mode: 1 hour 30 min. (P5-90) LP mode: 3 hours (P5-90)
Fast forward/rewind time	Approx. 6 min. 30 sec. (P5-90)
Image device	CCD (Charge Coupled Device)
Viewfinder	Electronic viewfinder (black and white)
Lens	Combined 10 × power zoom lens f=6.1 to 61 mm (1/4 to 2 1/2 inches) Approx. 44 to 440 mm (1 3/4 to 17 3/8 inches) converted into the focal length of a 35-mm still camera. F 1.6 with macro Filter diameter: 37 mm (1 1/2 inches) TTL autofocus system inner focus wide macro system
Colour temperature	AUTO
Minimum illumination	2 lx
Illumination range	2 lx to 100,000 lx (0.2 to 9294 footcandles)
Recommended illumination	More than 100 lx (9 footcandles)
Aperture correction	Automatic With backlight adjustment

Input and output connector

AEP, UK model

Video output	Phono jack 1 Vp-p, 75 ohms unbalanced sync negative
Audio output	Phono jack (L, R) Output: −7.5 dBs, (at load impedance 47 kilohms) mpedance less than 1 kilohm

E, Australian model

Video input/output	Selectable with the INPUT/OUTPUT selector Phono jack (L, R), 1 Vp-p, 75 ohms unbalanced sync negative

— Continued on next page —

8 VIDEO CAMERA RECORDER

SONY®

MICROFILM

Audio input/output	Selectable with the INPUT/OUTPUT selector Phono jack (L, R) Input: –7.5 dBs, input impedance more than 47 kilohms Output: –7.5 dBs, (at output impedance 47 kilohms) impedance less than 2.2 kilohms
RFU DC OUT	Special minijack, 5 V DC
Headphone jack	Stereo minijack, 8-ohm impedance
Remote ⊂ jack	Stereo mini-minijack
MIC jack	Stereo minijack, –66 dBs, low impedance with 2.5 to 3 V DC output, impedance 6.8 kilohms
Microphone power output jack	Special minijack, 5 V DC

General

Power requirements	On battery mounting surface 6.0 V (battery pack) 7.5 V (AC power adaptor) 9.0 V (alkaline batteries)
Power consumption	6.0 W (camera recording) including the viewfinder
Installation	Vertically, horizontally
Operating temperature	0°C to 40°C (32°F to 104°F)
Storage temperature	–20°C to +60°C (–4°F to +140°F)
Dimensions	Approx. 118 × 108 × 265 mm (w/h/d) ($4\frac{3}{4} \times 4\frac{3}{8} \times 10\frac{1}{2}$ in.)
Weight	Approx. 850 g (1 lb 14 oz) excluding the battery pack, lithium battery, cassette, lens cap, jack cover and shoulder strap Approx. 1070 g (2 lb 5 oz) including the battery pack NP-55H, lithium battery CR2025, cassette P5-90, lens cap, jack cover and shoulder strap

Microphone	Electret condenser microphone, uni-directional, stereo type

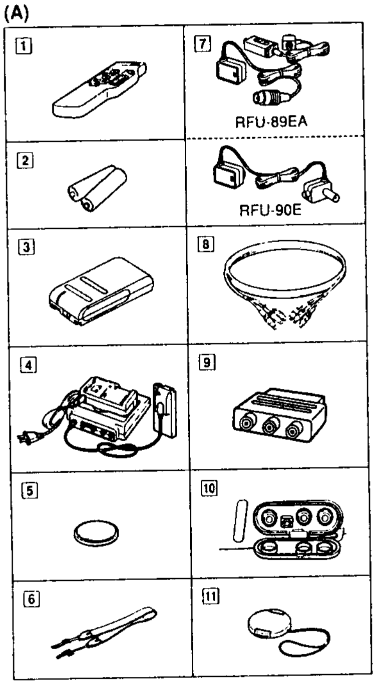
Wireless Remote Commander

Remote control system	Infrared control
Command mode	VTR 2
Power requirements	3 V DC, 2 size AA (R6) batteries
Dimensions	Approx. 48 × 19 × 130 mm (w/h/d) ($1\frac{15}{16} \times \frac{3}{4} \times 5\frac{1}{8}$ inches)
Weight	Approx. 50 g (1.8 oz) (excluding batteries)

Design and specifications are subject to change without notice.

Supplied Accessories

(A)



(A)

1 Remote Commander (1) (page 6)

2 Size AA (R6) battery for Remote Commander (2) (page 7)

3 Battery pack NP-55H (1) (page 8)

4 AC power adaptor AC-V25S (1) (page 10)

5 Lithium battery CR2025 (1) (page 14)

6 Shoulder strap (1) (page 5)

7 RFU adaptor RFU-90E or RFU-89EA
With the RFU-89EA, an aerial selector and a screwdriver are supplied. (38, 40)

8 A/V connecting cable (1) (page 42)

9 21-pin adaptor (1) (42)

10 Jack cover (1) (attached to the camcorder)

11 Lens cap (1) (attached to the camcorder) (page 20)

SAFETY CHECK-OUT

After correcting the original service problem, perform the following safety checks before releasing the set to the customer:

1. Check the area of your repair for unsoldered or poorly-soldered connections. Check the entire board surface for solder splashes and bridges.
2. Check the interboard wiring to ensure that no wires are "pinched" or contact high-wattage resistors.
3. Look for unauthorized replacement parts, particularly transistors, that were installed during a previous repair. Point them out to the customer and recommend their replacement.
4. Look for parts which, though functioning, show obvious signs of deterioration. Point them out to the customer and recommend their replacement.
5. Check the B+ voltage to see it is at the values specified.

SAFETY-RELATED COMPONENT WARNING!!

COMPONENTS IDENTIFIED BY MARK ⚠ OR DOTTED LINE WITH MARK ⚠ ON THE SCHEMATIC DIAGRAMS AND IN THE PARTS LIST ARE CRITICAL TO SAFE OPERATION. REPLACE THESE COMPONENTS WITH SONY PARTS WHOSE PART NUMBERS APPEAR AS SHOWN IN THIS MANUAL OR IN SUPPLEMENTS PUBLISHED BY SONY.

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5. E-E Output Level Check (VA-74 board) ········· 247
6. REC Matrix L-R Adjustment (VA-74 board) ········· 247
7. REC Matrix L+R Check (VA-74 board) ········· 247
8. IR Adjustment (VA-74 board) ········· 248
9. 1.5 MHz Deviation Adjustment ········· 248
10. 1.7 MHz Deviation Adjustment (VA-74 board) ········· 248
11. PB Matrix L Adjustment (VA-74 board) ········· 249
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13. Overall Level Characteristic, Distortion Check ········· 249
14. Separation Check ········· 250
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9-7. Arrangement Diagram for Adjustment Parts ········· 252

There is the color reproduction standard frame at the back of the book.

SERVICE NOTE

[SEMICONDUCTOR FOR CORRECTION LIST DISPLAY]

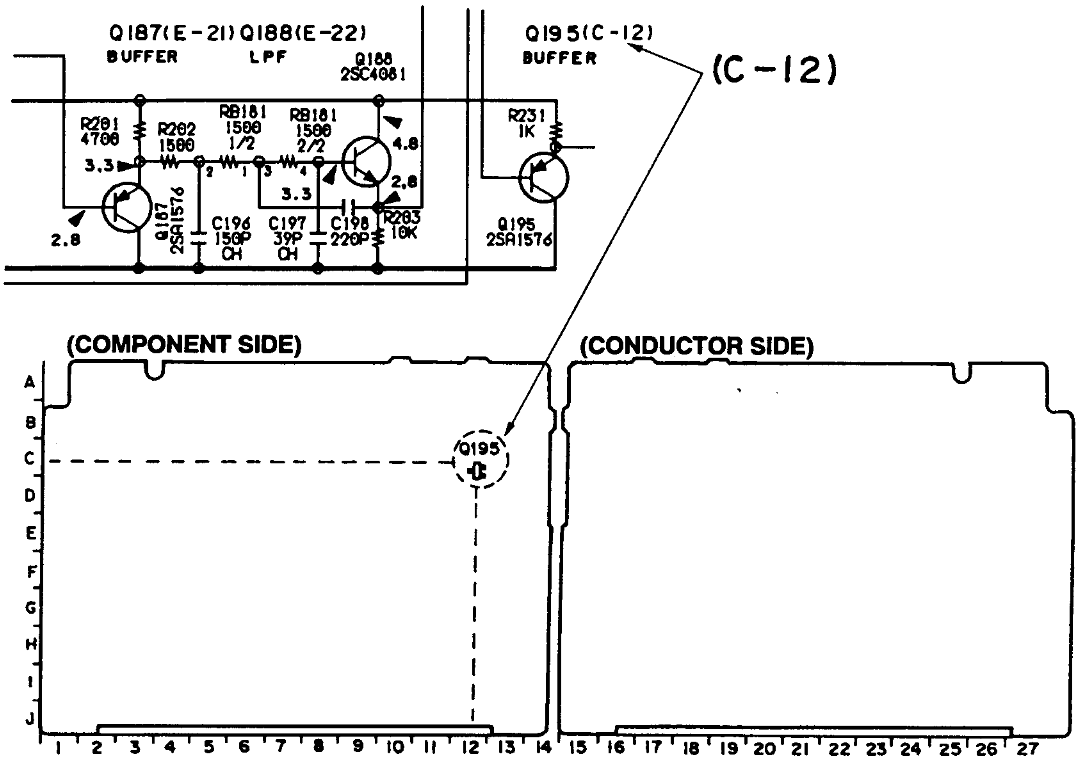
Part code and part name of the semiconductor for correction of the print board is discribed in the space of each print figure. Use this list when ordering parts.

[PARTS LOCATION DIAGRAM RELATED TO POWER SUPPLY]

The parts location diagram for the power supply which are often checked and replaced when repairing the fuse and IC link and so on. (See pages 93 and 113.)
This diagram is useful for repair.

[SEMICONDUCTOR LOCATION]

In this service manual, the mounted locations of the semiconductors (IC, transistor, diodes) are indicated in red as shown below. This enables to find the location on the board easily when servicing.


Q187(E-21) Q188(E-22)
BUFFER
LPF
Q188
2SC4081
Q195(C-12)
BUFFER
(C-12)
R201
4700
R202
1500
RB181
1500
1/2
RB181
1500
2/2
4.8
3.3
2.8
3.3
2
1
3
4
2.8
Q187
2SA1576
C196
150P
CH
C197
39P
CH
C198
220P
R203
10K
R231
1K
Q195
2SA1576
(COMPONENT SIDE)
(CONDUCTOR SIDE)
Q195
A
B
C
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[HEAD CLEANING]

After an extended period of use the video image may become indistinct or may not appear at all during playback of a tape. The cause of this usually are dirty video heads. For remedy, cleaning of the heads is required.

Check for Head Clogs During Recording

① Use a blank tape, record a short section, then press the stop button to stop.
② Set to recording mode again.
③ If the [✤] mark is flashing in the viewfinder at this time, head clogs are occurred.

Check During Playback of a Tape

① Play back a pre-recorded tape and display the image on a TV screen.
② If there is no sound and the image is unstable, no image appears on the screen, or tape transport is unstable, head clogs are occurred.

Remedy

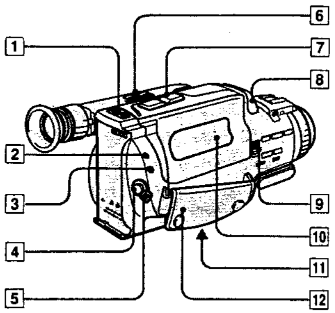
[Cleaning method using a cleaning tape]

- Use the Cleaning Tape. (Please follow the instructions attached to the cleaning tape.)

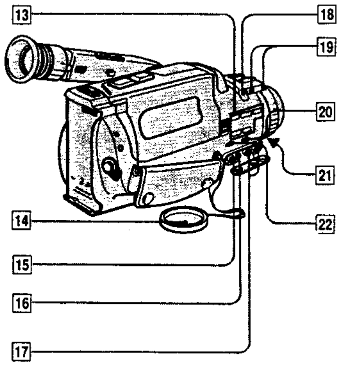
SECTION 1
GENERAL

Identifying the Parts

(B-1)



(B-2)



For details on the use of each part, refer to the pages indicated in the parenthesis.

(B-1)

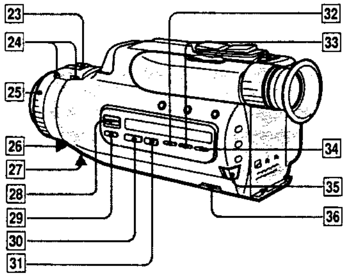
- 1 POWER switch (15)
- 2 ⇆ REMOTE (LANC)* control connector (stereo mini-minijack) (26)
- 3 ∩ (headphones) jack (stereo minijack) (25)
- 4 START/STOP button (20)
- 5 STANDBY switch (15)
- 6 EDITSEARCH (and ⊜ recording review) button (24, 25)
- 7 Power zoom (MACRO) button (23, 33)
- 8 Stereo built-in microphone
- 9 EJECT (cassette eject) knob (18)
- 10 Cassette holder (18)
- 11 Lithium battery holder (14)
- 12 Grip strap (20)

(B-2)

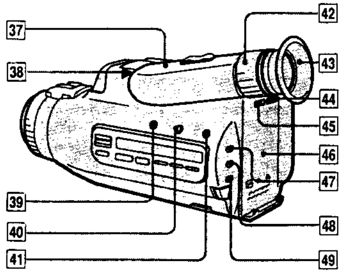
- 13 Tape transport buttons (44, 45)
  - ▷ PLAY (playback)
  - ▶▶ FF (fast-forward)
  - ◀◀ REW (rewind)
  - □ STOP (stop)
  - II PAUSE (pause)
- 14 Lens cap
- 15 VIDEO output jack (phono jack) (39)
- 16 RFU DC OUT (RFU adaptor DC output) jack (special minijack) (39)
- 17 AUDIO (L, R) output jack (phono jack) (39, 42)
- 18 MIC jack (PLUG IN POWER) (stereo mini-jack) (26)
- 19 Remote sensor (7)
- 20 REC MODE/EDIT switch (20, 47)
- 21 Shoulder strap hook (5)
- 22 Hi-Fi SOUND switch (45)

***About the ⇆ (LANC)**
⇆ LANC stands for Local Application Control Bus System. The LANC connector is used for controlling the tape transport of video equipment and peripherals connected to it. This connector has the same function as the connectors indicated as CONTROL L or REMOTE.

(B-3)

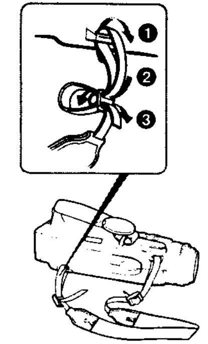


(B-4)



(B-5)

Attaching the shoulder strap



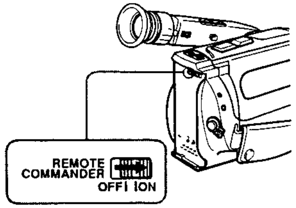
(B-3)

- 23 Accessory shoe (26)
- 24 Remote sensor (7)
- 25 Focus ring (28)
- 26 FADER button (34)
- 27 Tripod receptacle
- 28 AUTO LOCK switch (20)
- 29 BACK LIGHT button (29)
- 30 PROGRAM AE switch (30)
- 31 FOCUS button (28)
- 32 DATE (+) button (15, 16, 22)
- 33 TIME (NEXT) button (15, 16, 22)
- 34 AGE/EVENT button (16, 22)
- 35 BATT (battery eject) knob (9)
- 36 Shoulder strap

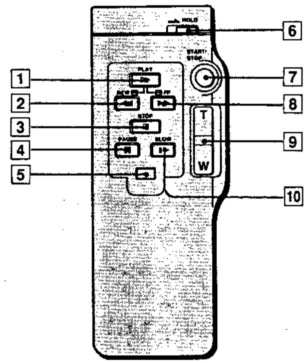
(B-4)

- 37 Viewfinder
- 38 Camera recording/battery lamp (back cover)
- 39 COUNTER RESET button (25, 46)
- 40 ZERO MEM button (25, 46)
- 41 TAPE/BATT CHECK button (9, 26)
- 42 Viewfinder adjustment ring (19)
- 43 Eyecup
- 44 BEEP switch (20)
- 45 ■ REMOTE COMMANDER switch (6)
- 46 Battery mounting surface
- 47 MEMORY button (35)
- 48 COLOR/MODE button (35)
- 49 SUPERIMPOSE ON/OFF button (35)

(B-6)



(B-7)



Wireless Remote Commander

You can control recording with the camera and playing back from a distance. The buttons on the Remote Commander with the same name or mark as those on the camcorder have the same function.

When you use the Commander (B-6)
Be sure to insert the supplied batteries into it (page 7) and to set the ■ REMOTE COMMANDER switch on the camcorder to "ON".
For details, refer to the pages indicated in the parenthesis.

(B-7)

1 **▷ PLAY (play back) button (25, 44)**

2 **◀◀ REW (rewind) button (25, 44)**

3 **□ STOP button (25, 44)**

4 **II PAUSE button (45)**

5 **DATA SCREEN button* (44)**

6 **HOLD switch* (45)**

7 **START/STOP button (20)**

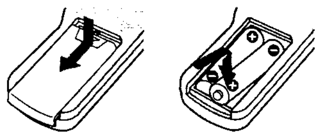
8 **FF ▶▶ (fast forward) button (44)**

9 **Power zoom button (23)**

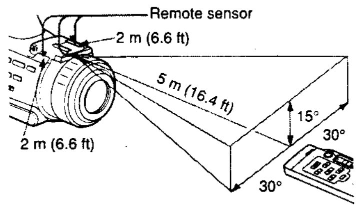
10 **I▶ SLOW (slow playback) button* (45)**

Note
The * indicates the functions which are operable only with the Commander.

(B-8)



(B-9)



Inserting batteries (B-8)
Insert two R6 (size AA) batteries with polarity positioned correctly.

Remote controllable area (B-9)
Aim the Commander at the remote sensor on the camcorder. The illustration shows the approximate maximum distance and angle for remote control.

Note on batteries
With normal operation, batteries will last for about six months. However, if the Commander will not be used for a long period, remove the batteries to avoid possible damage from battery leakage.

Notes on the Remote Commander
- **Do not use the remote sensor in a strongly lighted room, since it may not work properly under such condition.**
- Be sure that there is no obstacle between the remote sensor and Commander.
- **The command mode of the Commander is VTR2. Avoid using the Sony VTRs with the same command mode at the same time.**

Preparing your camcorder 1

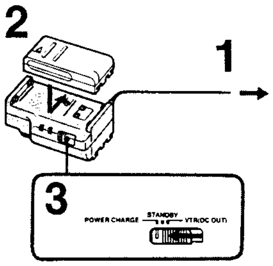
Connecting the Power Sources

First, Choose the Power Source.

For details, see the operation manual of the accessory you want to use.

Place	Power source	Accessory to be used
Outdoors	Battery pack	NP-55H (supplied), NP-55, NP-66H, NP-77, NP-77H or NP-77HD
	Alkaline batteries	Battery case EBP-77
Indoors	House current	AC power adaptor AC-V25S (supplied), AC-V30, AC-V35, AC-V65A or AC-S10
In the car	12 V or 24 V car battery	DC pack DCP-77, car battery charger DC-S10 or AC power adaptor AC-V55 and car battery cord DCC-16AE

(C-1)



Using the Battery Pack

Stap 1

Charge the battery pack. (C-1)
A new battery pack is not charged.

1. **Plug the AC power adaptor into a wall outlet.**
2. **Attach the battery pack to the AC power adaptor.**
   — Align the side of the battery pack with the white line on the AC power adaptor.
   — Push the battery pack down and slide it in the direction of the arrow.
3. **Set the CHARGE/VTR switch on the AC adaptor to CHARGE.**
   When charging is completed, the charge indicator on the AC power adaptor goes out.

	NP-55H (supplied)	NP-77H NP-77HD	NP-77	NP-66H	NP-55
Required charging time*	80	160	140	120	70
Battery life**	60	110	90	85	50

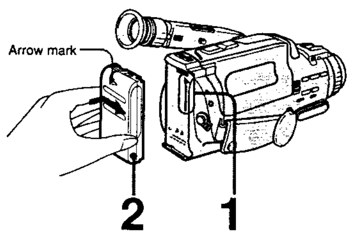
* Approximate time in minutes using AC-V25S
**Approximate time in minutes using fully charged battery pack, continous recording indoors

Important!
Use the battery completely before recharging!

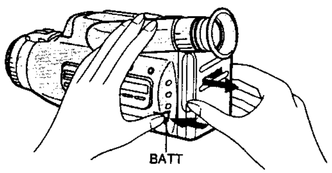
Before you recharge the battery, make sure the battery has been used (discharged) completely. Excessive charging may reduce the charging capacity of the battery.

To use up the battery, remove the video cassette, set the POWER switch to CAMERA with the battery attached and leave the camcorder until the ▭ indicator and a red lamp flash in the viewfinder.

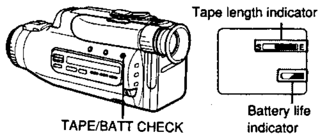
(C-2)



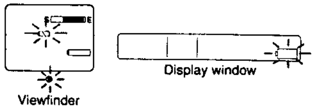
(C-3)



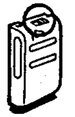
(C-4)



(C-5)



(C-6)



Step 2

Install the battery pack on the camcorder. (C-2)

1. **With the arrow mark on the battery pack up, align the flat side of the battery pack with the white line on the camcorder.**
2. **Push down and slide the battery pack in the direction of the arrow.**
   Note
   Make sure the battery pack is securely installed so that it does not come loose. If the battery is not installed properly, the camcorder does not work.

Removing the battery pack (C-3)
Press the BATT knob in the direction of the arrow, and at the same time, slide out the battery pack to the left.

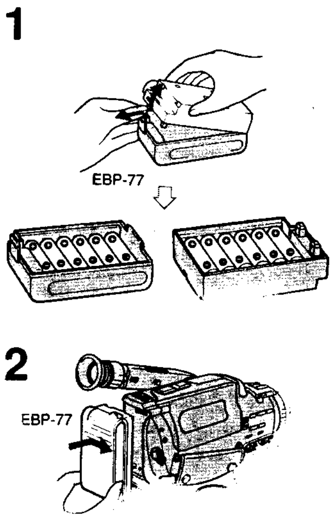
Battery life indicator

To check the remaining battery capacity, set the POWER switch to CAMERA, set the STANDBY switch up (see page 15) and press TAPE/BATT CHECK. **(C-4)** The black bar of the battery life indicator in the viewfinder and display window shows remaining battery capacity. After the black bar disappears, the ▭ indicator will appear and a red lamp will also flash in the viewfinder. When they flash rapidly, replace the battery pack. **(C-5)**

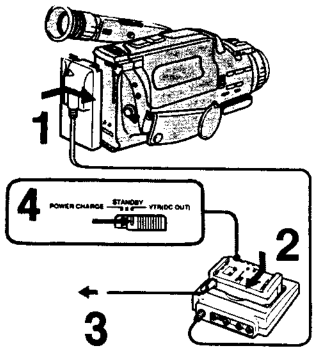
Notes
- The battery life indicator appears in the display window when the POWER switch is set to CAMERA or PLAYER with a power source attached.
- Charge the battery pack when the black bar of the battery life indicator decreases quickly.
- The battery life indicator of the camcorder may indicate a different remaining capacity from that on the NP-77HD battery pack.

How to use the switch on the battery pack (C-6)
This switch is provided so that you can remember the charging condition. Set the switch to the "no mark" position when charging is completed. Set the switch to the "red mark" position when the battery is used up.

(C-7)



(C-8)



Other options for charging
- AC-S10 AC power adaptor:
  This adaptor has a discharging function.
  It charges the battery pack after ensuring optimum battery capacity by complete discharging.
- DC-S10 car battery charger with discharging function:
  You can charge a battery pack through the cigarette lighter socket.

Using Alkaline Batteries

(C-7)

The battery case EBP-77 (not supplied) is required. Use twelve R6 (size AA) alkaline batteries.

Note
You cannot use manganese batteries with the battery case.

1. **Insert alkaline batteries into the battery case.**
2. **Attach the battery case in the same way as the battery pack.**

Battery life (when using Sony alkaline batteries)
You can continuously record with the EBP-77 for about 2 hours in a room. The batteries will not last as long in cold places.

Removing the battery case
Remove it in the same way as you do with the battery pack. See page 9.

Using Household Current

(C-8)

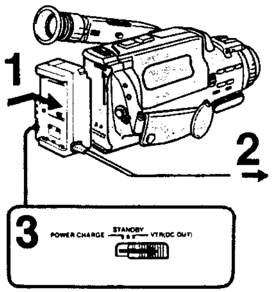
Use the supplied AC power adaptor AC-V25S. There are two ways of connecting the AC power adaptor to the camcorder.

With the connecting adaptor

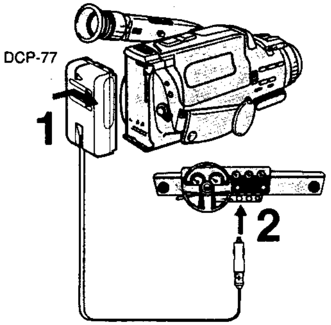
1. **Align the flat side of the connecting adaptor's connecting plate with the white line on the camcorder. Then push and slide it in the direction of the arrow.**
2. **Attach the AC power adaptor to the connecting adaptor.**
3. **Plug the AC power adaptor into the wall outlet.**
4. **Set the CHARGE/VTR switch on the AC power adaptor to VTR.**

Removing the connecting plate
The connecting plate is removed in the same way as the battery pack. See page 9.

(C-9)



(C-10)



Without the connecting adaptor (C-9)
(When using the camcorder with the AC power adaptor while on a trip, etc.)

1. **Align the flat side of the AC power adaptor with the white line of the camcorder. Then push and slide it in the direction of the arrow.**
2. **Plug the AC power adaptor into the wall outlet.**
3. **Set the CHARGE/VTR switch on the AC power adaptor to VTR.**

Removing the AC power adaptor
The AC power adaptor is removed in the same way as the battery pack. See page 9.

Using Car Battery

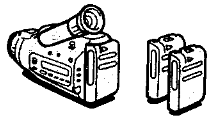
(C-10)

The DCP-77 DC pack (not supplied) is required .

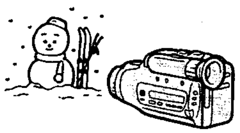
1. **Align the right side of the DC pack with the white line on the camcorder, and then push down and slide it in the direction of the arrow.**
2. **Connect the cord of the DC pack to the cigarette lighter socket of a car (12 V or 24V).**

Removing the DC pack
Remove it in the same way as the battery pack. See page 9.

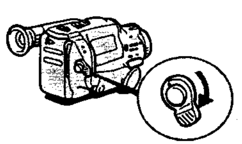
(D-1)



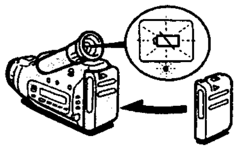
(D-2)



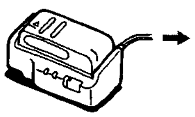
(D-3)



(D-4)



(D-5)



Using the Best out of the Battery Pack

Preparing the Rechargeable Battery Pack

Have sufficient battery pack power to do 2 to 3 times as much recording than you have planned. (D-1)
"Battery life" as indicated in the operation manual or catalogue of the camcorder is measured by the continuous recording time at a room temperature with a fully charged battery.

Battery life is shorter in a cold climate. (D-2)
Battery efficiency decreases and the battery will be used up more quickly.

Set the STANDBY switch down when not recording to save battery power. A smooth recording can be made while recording is stopped and started again. (D-3) While positioning the subject or selecting an angle, or looking through the viewfinder lens, the lens moves automatically and the battery is used. The battery is also used when a tape is inserted or removed.

When the Rechargeable Battery Pack Should Be Replaced

While you are recording, the black bar of the battery life indicator shows decreasing battery capacity. After the black bar disappears, the ▭ indicator and a red lamp will flash in the viewfinder. (D-4) When they flash rapidly, replace the battery pack.
Turn off the power switch of the camcorder and replace the battery pack.

Notes on Charging

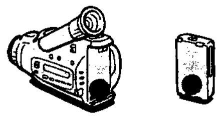
Before using the battery pack, charge it sufficiently. A new battery pack is not charged.

Recharge the battery pack only when it is exhausted. (D-5)

- Make sure to use up the battery before charging.
- If recording is completed before the ▭ indicator appears in the viewfinder, it is recommended that you remove the tape, set the POWER switch to CAMERA, set the STANDBY switch up until it snaps and leave the camcorder until the ▭ indicator flashes rapidly. When using the AC-S10 AC power adaptor or the DC-S10 car battery charger, you can discharge the battery with their discharging function.
- Repeated charging while some capacity remains causes a lowering of battery capacity.
  However, **the original battery capacity can be recovered if you fully discharge and charge the battery again.**

Recharge the battery pack just before using.
If the battery pack is charged fully but not used for a long time (about 1 year), it becomes discharged. Charge it again but in this case the battery life will be shortened than normal. After several charging and discharging cycles, the battery life will recover its original capacity.

(D-6)



(D-7)

Keep the Terminals Clean

If the terminals (metal parts on the back) are not clean, the battery duration will be shortened. (D-6)
When the terminals are not clean or when the battery pack has not been used for a long time, install and remove the battery pack from time to time. This will improve the contact condition.
Also, wipe the + and – terminals with a soft cloth or paper.

Notes on the Rechargeable Battery Pack

Why the battery pack heats up? (D-7)
During charging or recording, the battery pack heats up. This is caused by energy that has been generated and a chemical change that has occurred inside the battery pack. This is not a cause for concern.

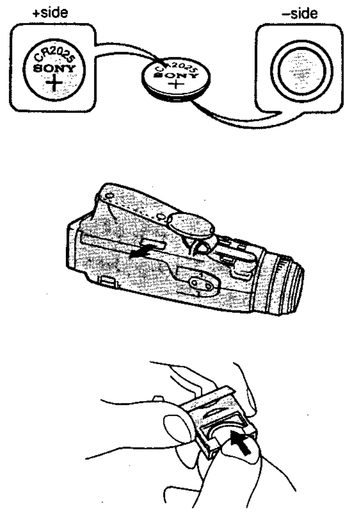
How to care for the battery pack

- Remove the battery pack from the camcorder after using it, and keep it in a cool place.
  When the battery pack is attached to the camcorder, a small amount of current flows to the camcorder even if the POWER switch is turned off. It causes overdischarging and shortens battery life.
- The battery pack is always discharging even when it is not in use after charging.
  Thus, it is recommended you charge the battery before using.

How many times can the battery pack be recharged ?
It can be fully charged and discharged about 500 times under normal temperatures.
If the ▭ indicator flashes rapidly just after turning on the camcorder with a fully charged battery pack, the battery pack should be replaced with a new fully charged one.

Temperatures during charging
Charge under temperatures ranging from 10°C to 30°C (50°F to 85°F). Lower temperatures require a longer charging time.

(E-1)



Preparing your camcorder 2

Setting the Date and Time

Inserting the Lithium Battery

(E-1)

To keep birth dates and a title in the camcorder's memory as well as to activate the clock, a lithium battery must be installed.
The lithium battery has a + (plus) side and a – (minus) side. Be sure to install the supplied lithium battery with the correct polarity.

1 **Remove the lithium battery holder at the bottom of the camcorder.**

2 **Install the supplied CR2025 lithium battery with the + side facing down.**

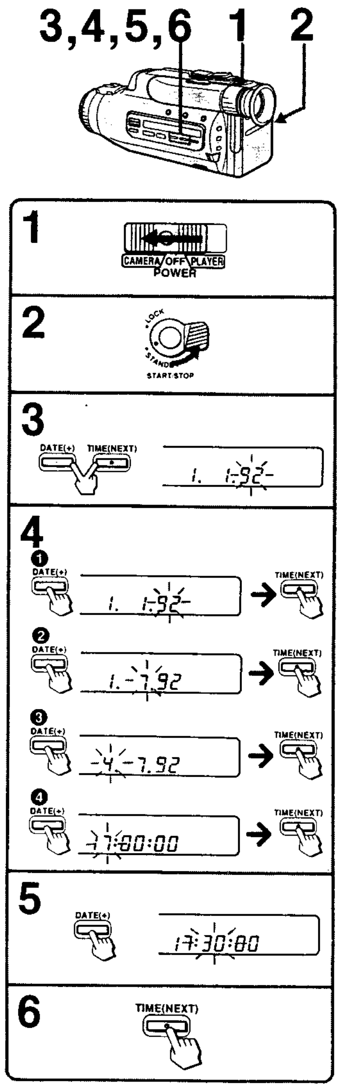
3 **Put the lithium battery holder into the camcorder.**

Replacing the lithium battery
Remove the lithium battery holder from the camcorder, and pull out the lithium battery and insert a new one.

Note on lithium battery life
The battery will last for approximately 1 year in normal operation.
When the lithium battery becomes weak, the ♻ indicator will flash in the viewfinder screen for about 5 seconds (when the POWER switch is set to CAMERA).
In this case, **replace the battery with a Sony CR2025. Use of any other type of battery may present a risk of fire or explosion.**
While replacing the lithium battery, keep the battery pack or other power source attached. Otherwise, readjustments of the date, time, title and birth dates are necessary.

Cautions
- Keep the lithium battery out of the reach of children.
  Should the battery be swallowed, immediately consult a doctor.
- Do not hold the battery with metallic tweezers, otherwise a short-circuit may occur.
- Battery may explode if mistreated.
  Do not recharge, disassemble or dispose of it in fire.

(E-2)



Setting the Date and Time

(E-2)

Make sure that a power source and lithium battery are attached.

1 **Press the small green button on the POWER switch and slide it to CAMERA.**

2 **Set the STANDBY switch up.**

3 **Press DATE (+) and TIME (NEXT) simultaneously for more than two seconds until the date indicator appears in the display window.**
The DATE (+) button now functions as + (to advance numbers) and the TIME (NEXT) button functions as NEXT (to set).

4 **Adjust the flashing digits of the year, month, day and hour using DATE (+), and press TIME (NEXT).**
- When you keep DATE (+) pressed, the digits advance faster.
- The year starts at 1992, and proceeds as follows:
  1992 ---→ 1999 → 2000 ---→ 2020
  ↑_______________________________|

5 **Adjust the flashing minute digits by pressing DATE (+).**

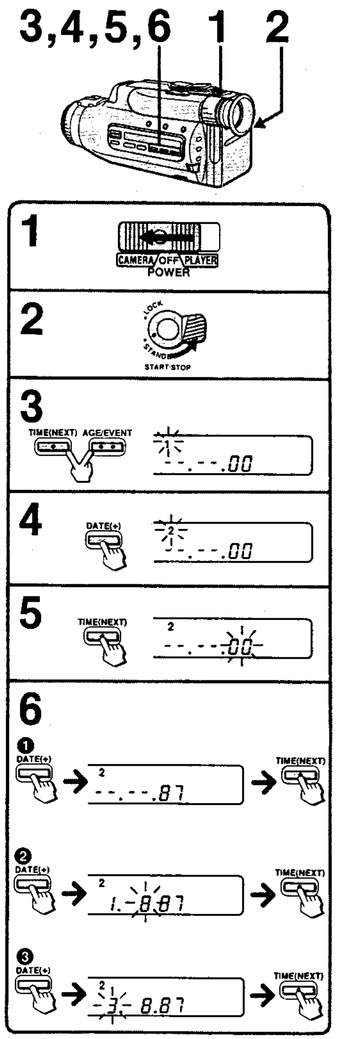
6 **Press TIME (NEXT) to set the second to "00".**
The clock starts working.

Correcting date and time setting
Repeat steps 3 to 6.

Checking the preset date and time
Press DATE (+) or TIME (NEXT). When you press the same button again, the indicator goes off.

If the camcorder goes off abruptly while setting the date and time
If you leave the camcorder in standby mode for 5 minutes or more, the camcorder will turn off automatically. Set the STANDBY switch down once and set it up again.

(E-3)



Storing a Birth Date in Your Camcorder

(E-3)

When your child's birth date is preset in the camcorder, you can put your child's age in years and months on your tape. You can also preset the date of an event. Once you enter the birth date of your child, the clock inside the camcorder will automatically update age of your child. You can superimpose the age any time on your recording. You can preset up to three birth dates or events.

Before you begin
Before storing the birth date in your camcorder, make sure that power source is connected, that the lithium battery is installed and that the date is correctly set.

Storing birth date
Example: store "Aug. 3, 1987" in memory 2.

1 **Press the green button on the POWER switch and slide it to CAMERA.**

2 **Set the STANDBY switch up.**

3 **Press TIME (NEXT) and AGE/EVENT simultaneously for a few seconds until the " 1-- -- 00" indicator appears in the display window.**

4 **Press DATE (+) to select 2.**
Each time you press DATE (+), the indicator in the display window changes as follows:

$$\begin{tikzcd} 1 \arrow[r] & 2 \arrow[r] & 3 \arrow[ll, bend left] \end{tikzcd}$$

In the viewfinder, the indicator changes as follows:

$$\begin{tikzcd} \boxed{1}\text{ BIRTHDAY} \arrow[r] & \boxed{2}\text{ BIRTHDAY} \arrow[d] \\ \boxed{3}\text{ EVENT*} \arrow[u, shift left=8] & \end{tikzcd}$$

* Although "EVENT" is displayed on 3, you can use it for age as well. 1 and 2 can also used for event.

5 **Press TIME (NEXT).**
The "00" indicator flashes.

6 **Enter the birth date of your child.**
First adjust the flashing digits with DATE (+), and then press TIME (NEXT). The age (year and month) appears when all items are adjusted.

If you missed the correct number with DATE (+)
Keep pressing DATE (+).
The indicator changes as follows:

$$\begin{tikzcd} \text{Year: } 1900 \arrow[r] & 1901 \arrow[r, dashed] & \text{Current year} \arrow[d] \\ & \text{Current year minus 99} \arrow[ul] & \end{tikzcd}$$

$$\begin{tikzcd} \text{Month: } 1 \arrow[r] & 2 \arrow[r, dashed] & 12 \arrow[ll, bend left] \end{tikzcd}$$

$$\begin{tikzcd} \text{Day: } 1 \arrow[r] & 2 \arrow[r, dashed] & 31 \arrow[ll, bend left] \end{tikzcd}$$

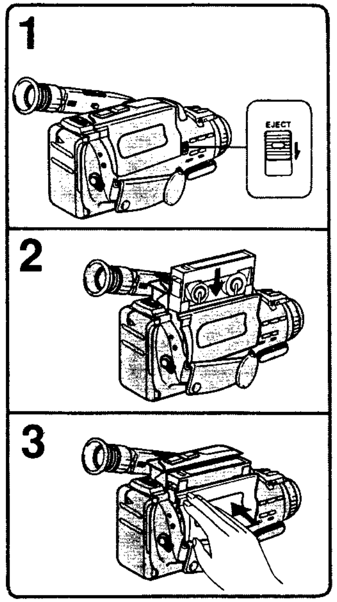
Correcting and changing the setting
Follow the procedures from step 1 again.

Advancing the digits faster
Keep DATE (+) pressed.

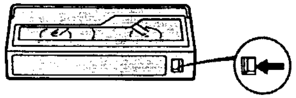
Presetting the year before 1900
1 After step 5 on page 16, keep pressing DATE (+) until the current year is displayed.
2 Press DATE (+) again
The year goes back 99 years.
(example: 1992 → 1893)
3 Go to step 6 in page 16.

When in 2000
"------1901" is displayed in step 3 on page 15. After that, it advances every years "1902, 1903, ---".

(F-1)



(F-2)



Preparing your camcorder 3

Inserting a Tape

Inserting a Tape

(F-1)

Make sure that a power source is connected.

1. **While pressing the small blue button, slide the EJECT knob in the direction of the arrow.**
   The cassette holder lifts up and opens.
2. **Insert a tape with the window facing outside.**
3. **Press the PUSH mark to close the cassette holder.**

Ejecting the Tape

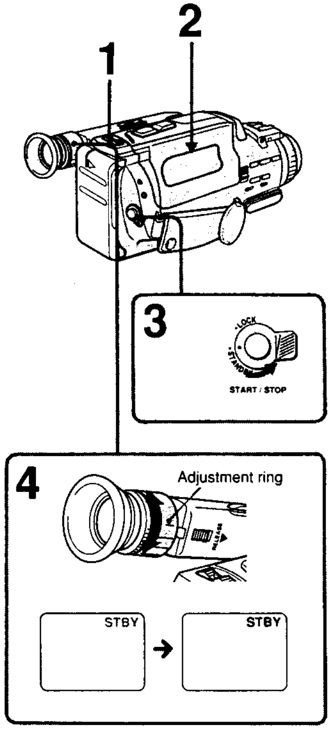
1 Make sure that a power source is connected.
2 While pressing the small blue button, slide the EJECT knob in the direction of the arrow.
3 Take out the tape and press the PUSH mark to close the cassette holder.

Preventing Accidental Erasure

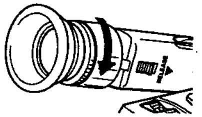
(F-2)

Slide the red tab closing the window to prevent accidental recording. To re-record on the tape, slide the tab opening the window.
If you try to record with the red mark exposed, the 📼 and ≜ indicators flash in the viewfinder and beeps sound for about 5 seconds.

(G-1)



(G-2)



Preparing your camcorder 4

Adjusting the Viewfinder Lens

The position of the viewfinder lens for optimum vision varies depending on the person. Adjust it when using for the first time, or when using after someone else. (G-1)

Make sure a power source is connected.

1. **While pressing the green button, set the POWER switch to CAMERA.**
2. **Insert a cassette. (See page 18.)**
3. **Set the STANDBY switch up until it snaps.**
4. **Turn the viewfinder lens adjustment ring so that the word "STBY" in the viewfinder screen comes into sharp focus.**

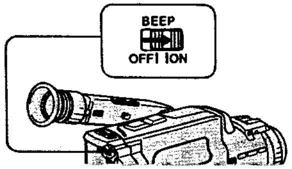
Using the viewfinder as a sports finder

The sports finder allows you to monitor the picture while your eye is at a distance from the eyecup.

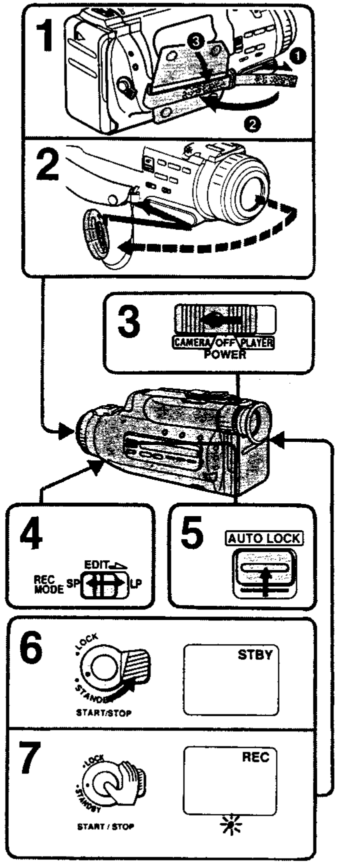
Setting the viewfinder to the sports finder position
Turn the viewfinder adjustment ring clockwise completely. (G-2)

Returning to the normal viewfinder position
Turn the adjustment ring counterclockwise until "STBY" in the viewfinder comes into sharp focus when a tape is in your camcorder.

(H-1)



(H-2)



Operating the Camera Section

Recording a Picture Using Automatic Adjustments

Before recording "once-only" events, we strongly recommend you make a trial record and check that everything is working perfectly.

Start Recording.

Using the BEEP switch
Normally set the BEEP swith to ON.
The camcorder beeps when you start and stop recording, and if any difficulty should arise during operation. If you want to deactivate the beeps, set the BEEP switch to OFF. **(H-1)**

(H-2)

1 **Hold the camcorder by putting your hand through the grip strap so that your thumb can easily press the red START/STOP button.**

2 **Remove the lens cap and attach it to the grip strap.**

3 **While pressing the green button, set the POWER switch to CAMERA.**

4 **Set the REC MODE switch to LP (long play) or SP (standard play), according to the length of your planned recording.**

5 **Set the AUTO LOCK switch to the green position.**

6 **Set the SATNDBY switch up.**
"STBY" appears in the viewfinder. Now, you can see a picture through the viewfinder.

7 **Press START/STOP (red button) once.**
The camera is recording when the word "REC" appears and red lamp lights up in the viewfinder. You can also confirm the recording start with the beep sound when the BEEP switch is turned on.

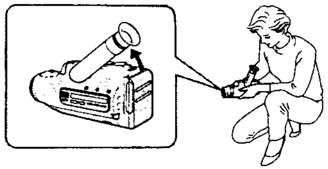
When recording with the Remote Commander
Confirm that the ■ REMOTE COMMANDER switch is set to ON. Aim the Commander at the remote sensor on the camcorder. Then press START/STOP on the Commander to start recording. To standby (to stop recording momentarily), press it again. For preparation of the Commander, see page 7.

To stop recording momentarily
Press START/STOP again.
Two beeps sound and "STBY" appears in the viewfinder.

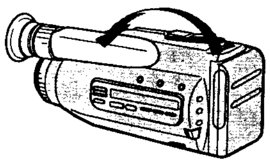
Automatic recording
With the AUTO LOCK switch set to the green position, all the camera functions are in automatic mode (i.e. auto aperture, auto white balance, auto focus) and the shutter speed is set at normal (1/50 second).

When you have finished recording
Set the STANDBY switch down and the POWER switch to OFF.

(H-3)



(H-4)



Recording From a low angle (H-3)
Set the viewfinder to the sports finder position (page 19) and turn it for a recording from a low angle.
(The viewfinder barrel can be turned 180 degrees.)
(H-4)

Notes
- Beeps are not recorded on the tape.
- For warning beeps, see back cover.

If the tape reaches near the end during recording
The ▭▭ indicator in the viewfinder and the display window, and the camera recording/battery lamp on the camcorder flash slowly.
When the tape reaches its end, flashing becomes rapid and beeps sound for about 5 seconds (if the BEEP switch is set to ON).

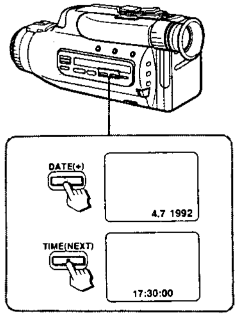
Notes on recording
- To record from the beginning of the tape, run the beginning of the tape for about 15 seconds before recording. This will avoid missing the starting point when the tape is played back.
- When moving from indoors to outdoors, or vice versa, set the STANDBY switch up until it snaps and point the camcorder at a white object for about 10 seconds so that the white balance is properly adjusted.

Note on standby mode
If you leave the camcorder in standby mode for 5 minutes or more, the camcorder will be automatically turned off. To resume standby mode, set the STANDBY switch down once and slide it up again.

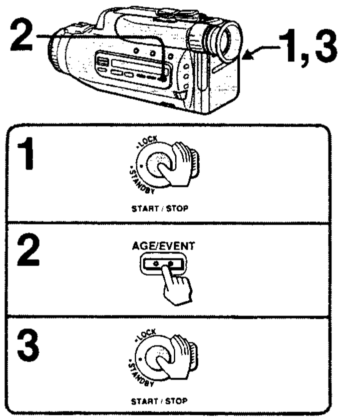
Note on light sources
If you are shooting a subject in bright conditions just after shooting in a dark place, the picture may not appear in the viewfinder. In this case, point the camcorder to the other direction.

Recording mode
You can record and play back a picture on a tape in both SP (standard play) and LP (long play) modes. However, the quality of the playback picture in the LP mode will not be as good as that in the SP mode.

(H-5)



(H-6)



Recording the Date or Time

(H-5)

During camera recording or when in standby mode, press DATE (+) for the date indicator or TIME (NEXT) for the time indicator.
The date or time indicator displayed in the viewfinder is recorded with the picture.

To stop recording date or time
Press DATE (+) or TIME (NEXT) again.
The picture recording continues.

Putting an Age on Your Tape

Here is how to put the age of your children on your tape while recording. **(H-6)**

1. **During recording, press START/STOP at the point where you want to insert the age of a person or the elapsed time.**
   This puts the camcorder in standby mode.
2. **Press AGE/EVENT to select the indicator you want to record.**
   Each time you press AGE/EVENT, the indicator changes as follows:

   $$\begin{tikzcd} \text{No indicator} \arrow[r] & \boxed{1}\ \text{The first age} \arrow[d] \\ \boxed{3}\ \text{The third age} \arrow[u] & \boxed{2}\ \text{The second age} \arrow[l] \end{tikzcd}$$

   In the display window, the indicator changes as follows:

   $$\begin{tikzcd} \text{No number} \arrow[r] & 1 \arrow[d] \\ 3 \arrow[u] & 2 \arrow[l] \end{tikzcd}$$

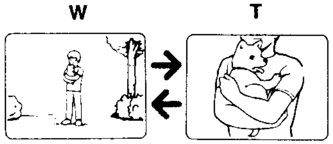
   An item with no presetting is skipped. The 1, 2 or 3 indicator goes out after one second.
3. **Press START/STOP.**
   Recording starts again. The indicator in the viewfinder is recorded with the picture.

To stop recording the age
Press AGE/EVENT until the indicator goes out.

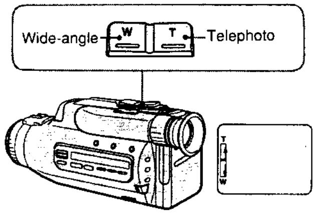
Changing the display while recording
Press AGE/EVENT until the indicator you want to record is displayed. Recording of the indicator you select start when 1, 2 or 3 goes out.

Note
You cannot add the age later during playing back or editing.

(H-7)



(H-8)



Canceling the stored birth date
1 Perform step 1 to 4 in "Storing a Birth Date in Your camcorder" in page 16, to select the memory number to be canceled.
2 Press TIME (NEXT) twice. The month indicator flashes.
3 Press DATE (+) until "--- ---" appears.
4 Press TIME (NEXT).
The birth memory is deleted from the memory and is not displayed when you press AGE/EVENT.

Zooming

By zooming, you can change the size of the subject in the scene. Use "zoom-in (Telephoto)" for dramatic close-ups, and "zoom-out (Wide-angle)" for panoramic long shooting. Also use the zoom to focus manually or to decide the shooting angle. But avoid using zoom-in or zoom-out too often. Use the zoom sparingly for zooming. **(H-7)**

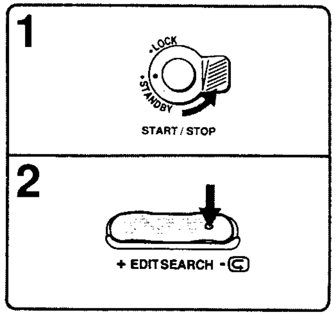
Two-levels Speed Zooming (H-8)
The camcorder's power zoom button offers two-level speed zooming.
Press the button firmly for high speed zooming and softly for relatively slow zooming.

W side: for wide-angle (subject appears farther way)
T side: for telephoto (subject appears closer)

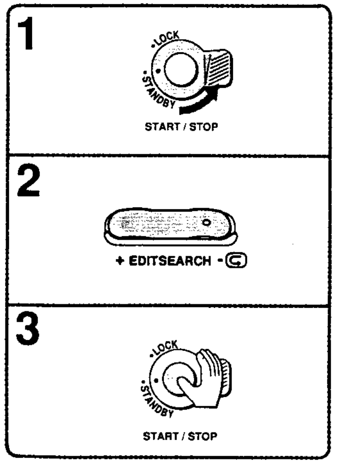
Two-level speed zooming cannot be operated with the power zoom button on the Commander.

Focal length of this camcorder
The focal length is 6.1 mm to 61 mm. This means approximately 44 mm to 440 mm converted into the focal length of a 35-mm still camera.

(H-9)



(H-10)



Checking the Recorded Picture in the Viewfinder (EDITSEARCH)

Using EDITSEARCH (⊜), you can review the last recorded scene or check the recorded picture in the viewfinder. After checking your recorded picture, you can also re-record over a previously recorded portion.

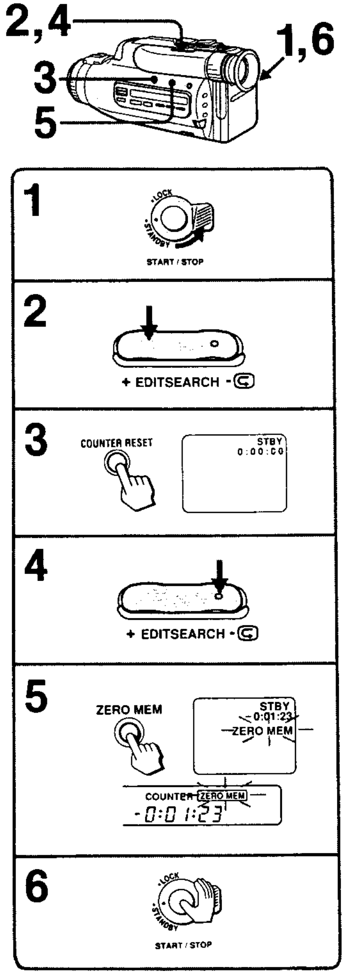
Reviewing the last recorded scene-RecReview
You can check the last portion of a scene you just recorded with the camera. This is convenient for quick, on-the-spot checks. **(H-9)**

1. **Set the camcorder into standby mode by setting the STANDBY switch up.**
2. **Press the – side of the EDITSEARCH (⊜) button momentarily.**
   The last few seconds of the recording portion are played back in the viewfinder. Then, the camcorder goes back to standby mode, ready for the next recording.

Checking your recorded picture-Editsearch
You can check the recorded picture in the viewfinder. After checking, you can also re-record over a previously recorded portion. **(H-10)**

1. **Set the camcorder in standby mode by setting the STANDBY switch up.**
2. **Keep pressing the + side or – side of the EDITSEARCH (⊜) button to play back the picture while looking in the viewfinder.**
   + side: to view the forward playback picture
   – side: to view the reverse playback picture
   To stop playback, release the EDITSEARCH button.
3. **If you want to re-record over a recorded portion, follow the procedures below:**
   1. Press the + side or – side of the EDITSEARCH button to locate the point you want to begin the re-recording.
   2. Press START/STOP to start re-recording. Re-recording begins from the point you released the EDITSEARCH button. As long as the tape is not ejected, the transition between the scenes will be smooth.

(H-11)



To monitor the sound while viewing the playback picture in the viewfinder

1. Connect headphones to the ∩ jack.
2. While pressing the green button, set the POWER switch to PLAYER.
3. Press ◀◀ (REW) to rewind the tape and press □ (STOP) where you want to stop.
4. Press ▷ (PLAY) to start playback.

Re-recording a Picture in the Middle of a Recorded Tape (Insert Recording)

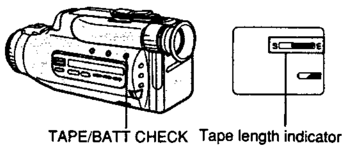
(H-11)

1. **Set the STANDBY switch up to set the camcorder into standby mode.**
2. **While looking in the viewfinder, keep pressing the + or – side of the EDITSEARCH button and release it where you want to end the insertion.**
3. **Press COUNTER RESET.**
   The counter is reset to zero.
4. **While looking in the viewfinder, keep pressing the – side of the EDITSEARCH button and release it at the point where you want to start the insertion.**
5. **Press ZERO MEM.**
   The insert ending point is stored in memory.
6. **Press START/STOP.**
   A beep sounds (if the BEEP switch is turned on) and insert recording begins. The insert recording stops automatically near the counter zero point.

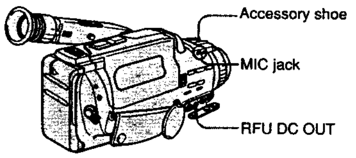
Cancelling the ZERO MEM
Press ZERO MEM.

Note
The picture may be distorted at the end of the inserted portion when played back.

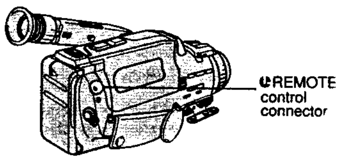
(H-12)



(H-13)



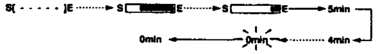
(H-14)



Recording a Picture Using Automatic Adjustments

To check the time remaining of the tape (H-12)
Press TAPE/BATT CHECK.

The tape length indicator which shows the tape time remaining appears in the viewfinder. (It may take about 20 seconds to display it.) When the time remaining is less than about 5 minutes, the indicator shows the minutes remaining.



When "5 min" appears, the 📼 indicator flashes in the viewfinder.

Notes on the tape length indicator

- The camcorder must be in the recording or playback mode when the TAPE/BATT CHECK button is pressed to find out the time remaining. In playback mode, however, the indicator does not show the minutes remaining.
- The tape length indicator does not change while using EDITSEARCH.

Recording with an External Microphone

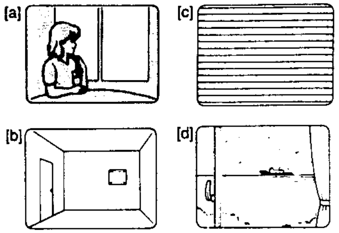
You can connect an external microphone (not supplied) to the MIC jack. This jack also accepts a "plug-in power" microphone.
If the microphone has two plugs, connect the DC IN plug to the RFU DC OUT jack on the camcorder.
Attach the microphone to the accessory shoe of the camcorder. **(H-13)**

Note
When using an external microphone, wind noise is not muted.

Connecting a Wired Remote Control Unit

When you connect a wired remote control unit or editing controller (not supplied) to the REMOTE connector, you can operate your camcorder from a distance. **(H-14)**

(I-1)



Making Manual Adjustments

The camcorder's automatic functions offer you worry-free operation under most shooting conditions. But in some circumstance, manual adjustment is better for effective recording. You can manually adjust focus and back light compensation with this camcorder. The settings not changed to manual mode remain in the automatic mode.
As long as you do not remove the battery, even if you set the POWER switch to OFF, the previous manual settings are retained.

Manual Focusing

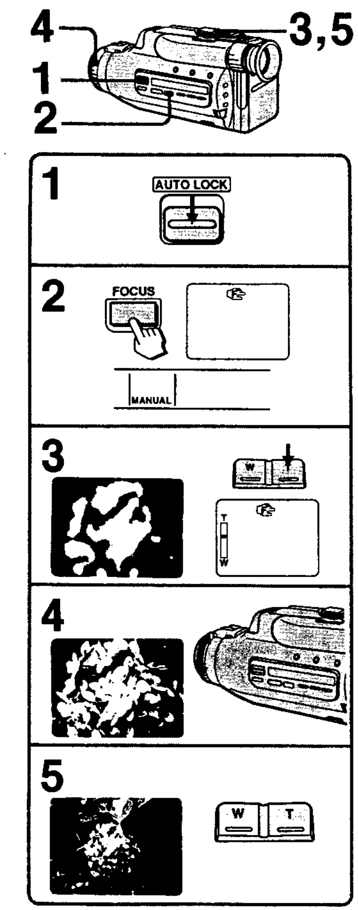
When to use manual focus
You should also focus manually in the following situations **(I-1)**:

[a] Too much brightness behind the subject
[b] Subjects with little contrast-wall, sky, etc.
[c] Horizontal stripes
[d] Subject through frosted glass

- Insufficient light
- One subject is close; the other is in the center, but at a distance
- Bright subject or subject reflecting light
- High contrast behind the subject (The background may be focused.)
- When shooting a stationary subject using a tripod
- When you want to save battery power
- Autofocusing does not function momentarily when:
  - The setting of the shutter speed is changed.
  - Backlight is adjusted manually.
  - Lighting conditions change quickly.
  - Zooming is changed from wide-range to telephoto.

This camcorder keeps in focus by referring to the picture contrast, which is weak in the above situations.

(I-2)



Focusing Manually

(I-2)

1 **Set the AUTO LOCK switch down.**

2 **Press FOCUS.**
☞ appears in the viewfinder, and "MANUAL" appears in the display window.

3 **Keep pressing T side (Telephoto) of the power zoom button until the zooming stops.**
The power zoom indicator appears in the viewfinder.

4 **Turn the focus ring to achieve sharp focus.**

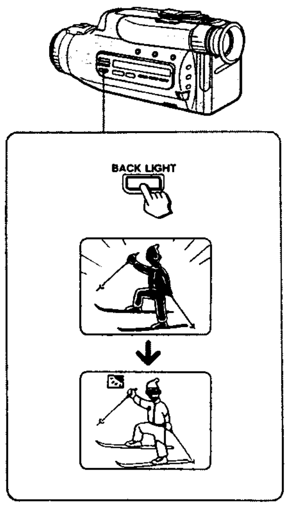
Note
The focusing ring does not have a stop position.

5 **Set the desired shot length using the power zoom button.**

Resetting autofocus
Press FOCUS until the ☞ in the viewfinder disappears. "MANUAL" disappears and "AUTO" appears in the display window.

Shooting in relatively dark places
When shooting in relatively dark places such as indoors, the depth of field in proper focus is very shallow. For best results, shoot at wide angles after focusing in telephoto.

(J)



Compensating Backlighting

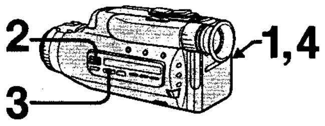
In this camcorder, the iris is automatically controlled. However, when shooting a subject that is backlit, that is, if the light source is coming in from the back of the subject, use the BACK LIGHT button. **(J)**

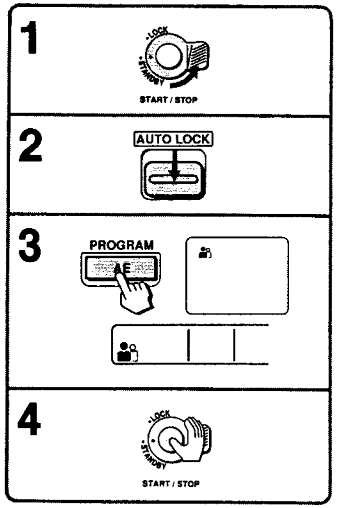
Press BACK LIGHT.
The ⊡ indicator appears. If it does not appear, press the button again.

After shooting, be sure to release this adjustment condition by pressing BACK LIGHT again. (The ⊡ indicator goes out.)
Otherwise, the recorded picture will become too bright.

(K-1)

(K-2)





Using Program AE

When you use the PROGRAM AE (Auto Exposure) function, you can create a "portrait" effect (shallow depth of field) or capture high-speed action with "sports" mode or "high-speed shutter" mode.

What is PROGRAM AE (Auto Exposure) ?
Program AE automatically selects just the right combination of shutter and aperture settings and gives you creative control for depth of field (distance range of objects that will be in sharp focus). There are four preprogrammed modes: Normal (no indicator), Portrait, Sports and High-speed shutter. (See page 30 to 32.)

Note
When recording under fluorescent, sodium, or mercury lamp, the brightness of the recorded picture may vary, or the color of the recorded picture may become unnatural.

Portrait Mode

(K-1)

In Portrait mode, the object is in focus and the background is out of focus. The opening of the iris and the shutter speed are automatically adjusted to maintain the appropriate exposure according to the size and brightness of the object. The portrait mode is most effective to be used outdoors.

Use Portrait mode in the following situations:
- a still subject such as person or flower
- zooming in a subject in the telephoto mode
- when there is something between the camcorder and the subject, such as a chain link fence

Setting to portrait mode (K-2)

1 **Set the STANDBY switch up.**

2 **Set the AUTO LOCK switch to the lower position.**

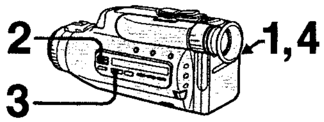
3 **Press PROGRAM AE until appears in the display window and the viewfinder.**

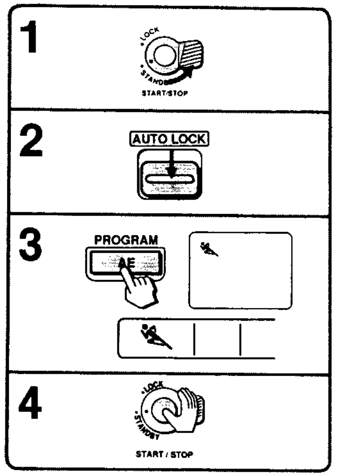
4 **Press START/STOP.**
Recording in portrait mode starts.

Resuming automatic mode
Set the AUTO LOCK switch to the green position.

(K-3)

(K-4)





Sports Mode

(K-3)

In Sports mode, you can clearly record subjects moving at high speed, providing a high-quality picture with minimum blur in the slow and still playback modes. The fastest shutter speed that matches the shooting situation (between 1/50 and 1/500) is selected to maintain the appropriate exposure. Sports mode provides more effective recording that you can achieve in the high-speed shutter mode.

You may want to use Sports mode when shooting the following subjects:
- outdoor sports scene such as football or tennis
- recording a landscape from the running car

Setting to Sports mode (K-4)

1 **Set the STANDBY switch up.**

2 **Set the AUTO LOCK switch to the lower position.**

3 **Press PROGRAM AE until appears in the display window and the viewfinder.**

4 **Press START/STOP.**
Recording in Sports mode starts.

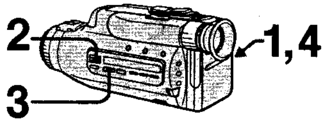
Resuming the automatic mode
Set the AUTO LOCK switch to the green position.

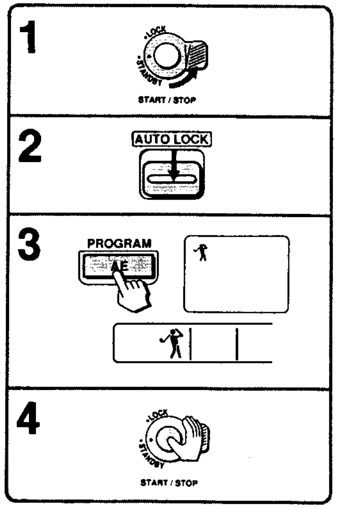
Hint for effective camera work
When shooting athletic matches from a distant, such as a football game, we tend to zoom from the wide to the telephoto position to catch the once-only events. Even under these circumstances, by using Sports mode, a sharp picture can be obtained when played back later in the slow or still mode.

Note
The sports mode is effective under sufficient lighting, such as under sunlight. When used under extremely dark conditions, the shutter speed may not be shifted to high speeds.

(K-5)

(K-6)





High-speed Shutter Mode

(K-5)

In High-speed shutter mode, the shutter speed is set to 1/4000. Subjects moving at high speed can be recorded and the picture can be observed more clearly with less picture shaking in the still or slow modes compared to slower shutter speeds. Remember that you need enough lighting to use High-speed shutter mode since the aperture is fixed.

You may want to use High-speed shutter mode when:

- shooting a golf swing or a tennis match to capture the tennis ball clearly.
- you wish to play back certain scenes with high-speed movement in a clear, sharp picture.

Setting to High-speed shutter mode (K-6)

1 **Set the STANDBY switch up.**

2 **Set the AUTO LOCK switch to the lower position.**

3 **Press PROGRAM AE until ⛳ appears in the display window and the viewfinder.**

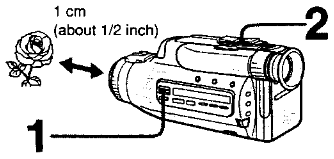
4 **Press START/STOP.**
Recording in the high-speed shutter mode starts.

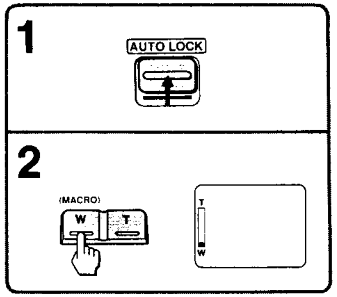
Resuming the normal shutter speed
Set the AUTO LOCK switch to the green position.

Notes

- In High-speed shutter mode, record under sunlight or use a video light.
- When you record a TV screen in High-speed shutter mode, the brightness of the recorded picture may vary.
- When you shoot a very bright subject in High-speed shutter mode, a light vertical, belt-like line ("smear") may appear on the screen.

(L)





Close-up (Macro)

(L)

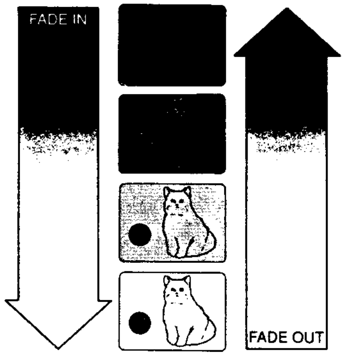
You can shoot subjects that are at least 1 cm (about 1/2 inch) away from the lens surface. When doing close-up, the depth of field (range the subject will be in sharp focus) is very shallow. So pay attention to focusing. To keep the subject in focus, use a tripod.

1 **Set the AUTO LOCK switch to the green position.**

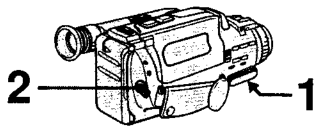
2 **Press the W side of the power zoom button until the indicator inside the viewfinder stops at the W end.**

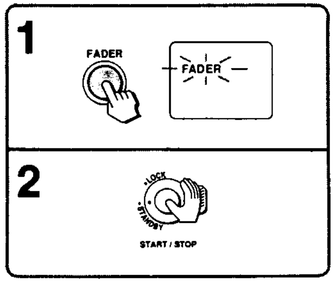
Manual adjustment
You can shoot with manual focus in doing close-up. For details, see page 28.

(M-1)



(M-2)





Fade-in and Fade-out

You can fade-in or fade-out to give your recording a professional appearance.
When fading-in, the picture will gradually appear from black. The sound will also gradually increase.
When fading-out, the picture will gradually fade to black. The sound will decrease. **(M-1)**

(M-2)

When fading-in

1. **Press FADER after setting the STANDBY switch up to put the camcorder into standby mode.**
   The fade indicator starts flashing.
2. **Press START/STOP.**
   The fade indicator stops flashing and the recording starts fading in.

When fading-out

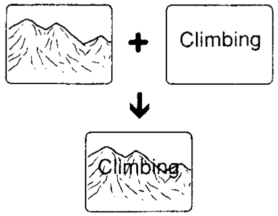
1. **Press FADER while recording.**
   The fade indicator starts flashing.
2. **Press START/STOP.**
   The fade indicator stops flashing and the picture fades out and then the recording stops.

Cancelling the fade-in/fade-out function
Before pressing START/STOP, press FADER again.

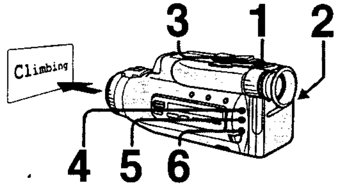
Using the fade-in/out function repeatedly
Start from step 1 each time.

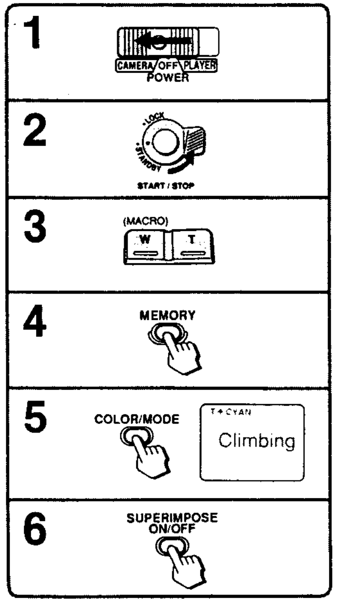
When the date/time (page 22) or age (page 22) is displayed
The date/time, or age does not fade-in or fade-out.

(N-1)



(N-2)





Superimposing a Title

You can superimpose your own hand-written message or graphics (title) over the picture during recording or playback (editing). **(N-1)**

Before recording, store a title.

Storing a Title

(N-2)

Before storing

- Make a desired title card.
  Use a plain, white card and draw a title in a dark coloured marker using wide strokes.
  You can also use the available graphics or a sign if they are thick enough and have contrast.
- Make sure the lithium battery is installed. (page 14)

Storing a title

1. **While pressing the green button on the POWER switch, slide it to CAMERA.**
2. **Set the STANDBY switch up to put the camcorder into standby mode.**
3. **Aim the camcorder at the title card and adjust the focus using the macro position (see page 33).**
4. **Press MEMORY to store the title.**
5. **Press COLOR/MODE and select the title colour.**
   Each time you press the button, the indicator changes as follows.
   WHT (white) → BLUE → GRN (green) → CYAN → RED
   ↑ BLK (black) ← YEL (yellow) ← VIO (violet) ←
6. **Press SUPERIMPOSE ON/OFF to turn off the title.**
   Now, a title is stored in memory.

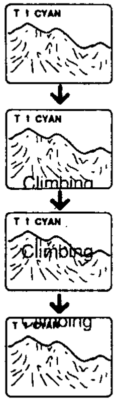
Cheking the title
Press SUPERIMPOSE ON/OFF in the standby mode.
To turn off the title, press the button again.

Various Display Modes of the Title

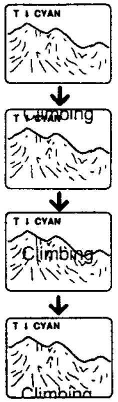
You can scroll your title up or down, or reverse the title.
Select the display mode of the title from the following table.

Display mode	Indicator in the viewfinder
Scrolling the title up (N-3) The title scrolls up and stops at the center.	↑
Scrolling the title down (N-4) The title scrolls down and stops at the center.	↓
Reversing the title with the picture (N-5)	▯
Scrolling the reversed title up (N-6)	▯↑
Scrolling the reversed title down (N-7)	▯↓
Normal display mode	No indicator

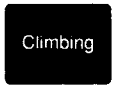
(N-3)



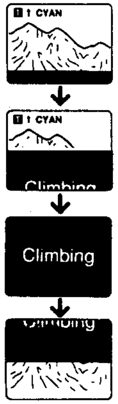
(N-4)



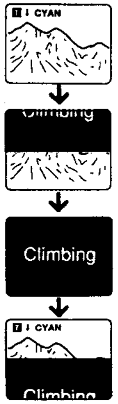
(N-5)



(N-6)

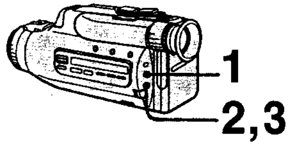


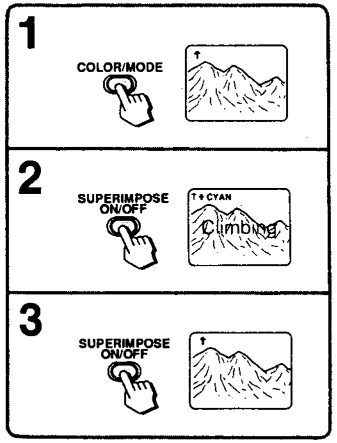
(N-7)



Superimposing a Title on Your Tape

(N-8)





(N-8)

The following example shows you how to superimpose a title with the scrolling up effect. The colour name and the display mode indicators in the viewfinder will not be recorded.

Before superimposing the title, store it in the camcorder.

1. **In standby mode, press COLOR/MODE to select the display mode of the title.**
   (For display modes of the title, see page 36.)
2. **Press SUPERIMPOSE ON/OFF at the point from which you want to insert the title in standby mode or during recording.**
   The title appears.
   To scroll the title without stopping, press the button twice repeatedly.
3. **At the point you want to turn off the title, press SUPERIMPOSE ON/OFF again.**
   The title goes out.

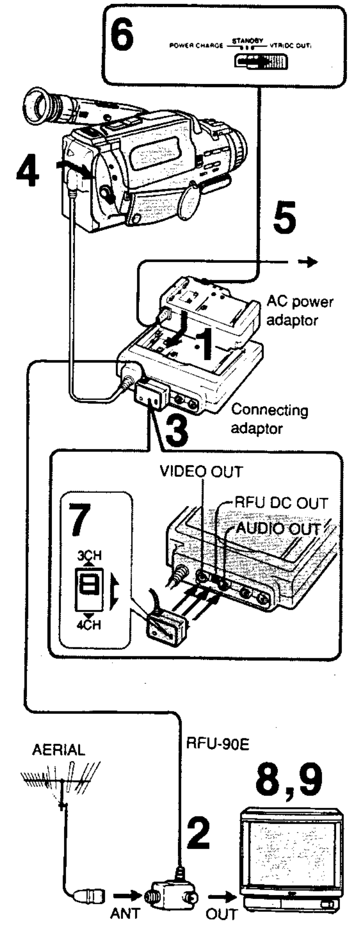
Superimposing a title at the beginning
1 Set the camcorder in the standby mode.
2 Press SUPERIMPOSE ON/OFF.
3 Start recording with the title displayed in the viewfinder.
4 At the point you want to turn off the title, press SUPERIMPOSE ON/OFF again.

Function of the COLOR/MODE button
This button has a double function: one is to select the title colour and the other is to select the title display mode. **(N-9)**

(N-9)

To select the colour, display the title. Then press COLOR/MODE.
To select the display mode, press COLOR/MODE before displaying the title.

(O-1)


6
POWER CHARGE
STANDBY
VTR/DC OUT
4
5
AC power adaptor
1
Connecting adaptor
3
VIDEO OUT
RFU DC OUT
AUDIO OUT
7
3CH
4CH
AERIAL
RFU-90E
8,9
2
ANT
OUT

Operating the PLAYER section

Connections for Playback

You must connect the camcorder to the TV and/or VTR properly to view the playback picture.
First check if your TV has video/audio input jacks.
For details on the TV and VTR, refer to their operation manuals.

Case 1: Connecting a TV without Video/Audio Input Jacks

For the customers supplied with the RFU-90E

Before you begin

- Use the supplied RFU adaptor and AC power adaptor.
- Make sure that the TV is turned off.

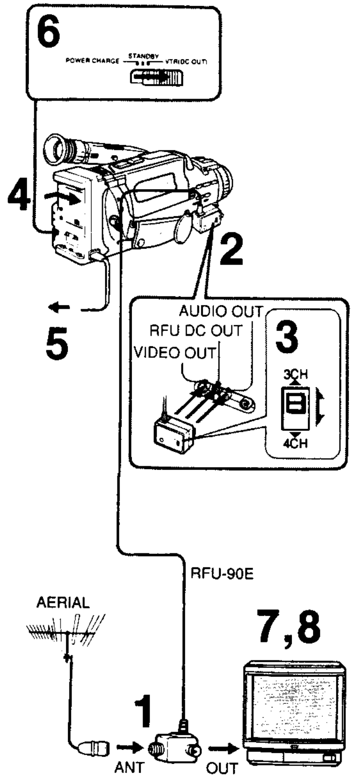
With the connecting adaptor (O-1)

1 Attach the AC power adaptor onto the connecting adaptor.
2 Connect the aerial and the TV to the RFU adaptor.
3 Connect the RFU adaptor to the connecting adaptor.
4 Attach the connecting plate of the connecting adaptor to the camcorder.
5 Plug the AC power adaptor into a wall outlet.
6 Set the CHARGE/VTR switch of the AC power adaptor to VTR.
7 Set the RF unit selector of the RFU adaptor to 3CH or 4CH, whichever is not used in your area.
8 Turn on the TV and select the 0 position.
9 Tune the TV on so that you can get a picture and sound from the camcorder.

Notes

- Unplug the AC power adaptor from the wall outlet when not in use for a long time.
- You can use the charged battery pack instead of the AC power adaptor in step 1.
- The video and audio jacks on the connecting adaptor are used only for output video and audio signals from the camcorder.
- Playback sound is monaural when using the RFU adaptor.

(O-2)


6
POWER CHARGE
STANDBY
VTR/DC OUT
4
2
5
AUDIO OUT
RFU DC OUT
VIDEO OUT
3
3CH
4CH
RFU-90E
AERIAL
7,8
1
ANT
OUT

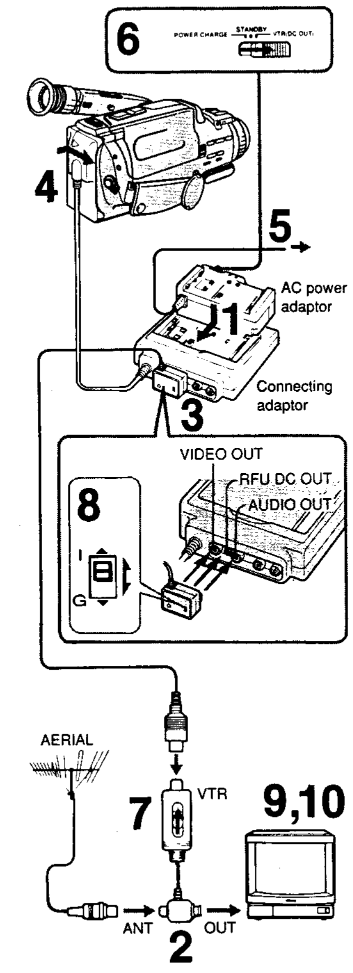
Without the connecting adaptor (O-2)
(When using the camcorder with the AC power adaptor while on a trip, etc)

1 Connect the aerial and the TV to the RFU adaptor.
2 Connect the RFU adaptor to the camcorder.
3 Set the RF unit selector of the RFU adaptor to 3CH or 4CH, whichever is not used in your area.
4 Attach the AC power adaptor to the camcorder.
5 Plug the AC power adaptor into the wall outlet.
6 Set the CHARGE/VTR switch of the AC power adaptor to VTR.
7 Turn on the TV and select the 0 position.
8 Tune the TV so that you can get a picture and sound from the camcorder.

When you watch a TV programme
Set the CHARGE/VTR switch of the AC power adaptor to STANDBY or turn off the power of the camcorder.

Connections for Playback

(O-3)


6
POWER CHARGE
STANDBY
VTR/DC OUT
4
5
AC power adaptor
1
Connecting adaptor
3
VIDEO OUT
RFU DC OUT
AUDIO OUT
8
I
G
AERIAL
7
VTR
9,10
ANT
OUT
2

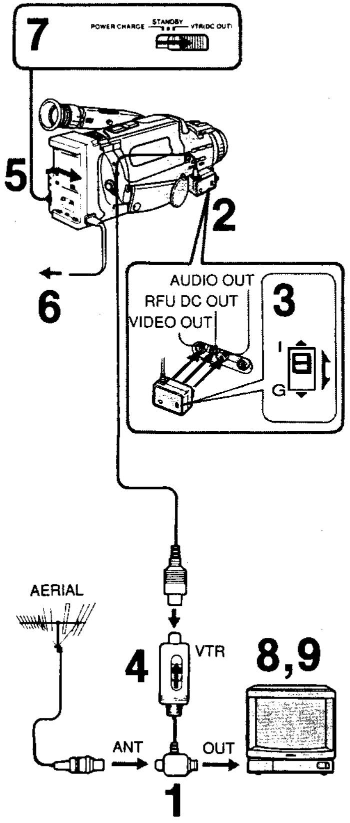
For the customers supplied with the RFU-89EA

With the connecting adaptor (O-3)

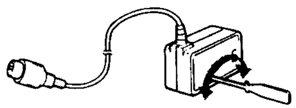
1 Attach the AC power adaptor onto the connecting adaptor.
2 With the RFU adaptor and the aerial selector (both supplied) joined, connect the aerial and the TV to the RFU adaptor.
3 Connect the RFU adaptor to the AC power adaptor.
4 Attach the connecting plate of the connecting adaptor to the camcorder.
5 Plug the AC power adaptor into a wall outlet.
6 Set the CHARGE/VTR switch of the AC power adaptor to VTR.
7 Set the selector switch of the aerial selector to VTR.
8 Set the I/G selector of the RFU adaptor according to the TV system of your country.
9 Turn on the TV and select a programme position that is not used in your area.
10 Tune the TV so that you can get a picture and sound from the camcorder.

Connections for Playback

(O-4)


7
POWER CHARGE
STANDBY
VTR/DC OUT
5
2
6
AUDIO OUT
RFU DC OUT
VIDEO OUT
3
I
G
AERIAL
4
VTR
8,9
ANT
OUT
1

(O-5)



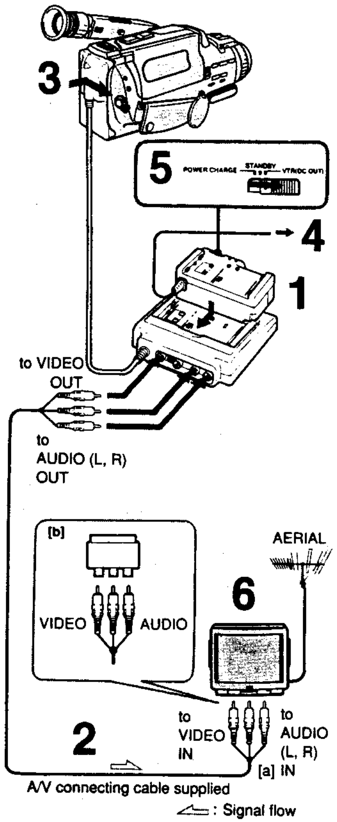
Without the connecting adaptor (O-4)
(When using the camcorder with the AC power adaptor while a trip, etc.)

1 With the RFU adaptor and the aerial selector (both supplied) joined, connect the aerial and the TV to the RFU adaptor.
2 Connect the RFU adaptor to the camcorder.
3 Set the RF unit I/G selector of the RFU adaptor according to the TV system of your country.
4 Set the aerial selector to VTR.
5 Attach the AC power adaptor to the camcorder.
6 Plug the AC power adaptor into a wall outlet.
7 Set the CHARGE/VTR switch of the AC power adaptor to VTR.
8 Turn on the TV and select the programme position that is not used in your area.
9 Tune the TV so that you can get a picture and sound from the camcorder.

When the playback picture is deteriorated

1 Set the selector switch of the aerial selector to ANT.
2 Select the programme position on the TV between UHF channels 30 and 39, so that the TV shows no picture and a steady rustling sound or no sound is heard.
3 Set the selector switch of the aerial selector to VTR.
4 Turn the RF channel setting screw of the RFU adaptor slowly with the supplied screw driver, so that playback picture is clearly displayed on the TV screen. (O-5)

(O-6)


3
5
POWER CHARGE STANDBY VTR/DC OUT
4
1
to VIDEO OUT
to AUDIO (L, R) OUT
[b]
VIDEO
AUDIO
AERIAL
6
2
to VIDEO IN
to AUDIO (L, R) [a] IN

A/V connecting cable supplied

: Signal flow

Case 2: Connecting a TV with Video/Audio Input Jacks

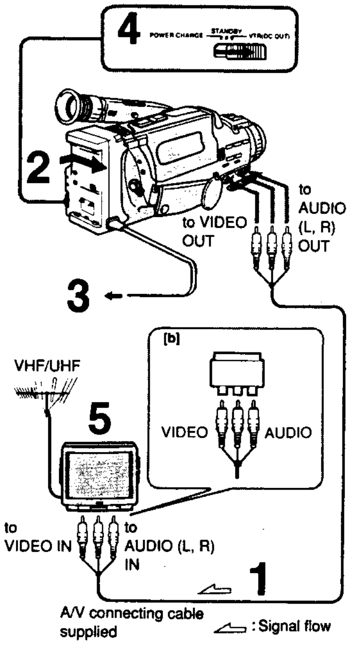
Before you begin

- Use the supplied AC power adaptor and A/V connecting cable.
- Make sure that the TV is turned off.

With the connecting adaptor (O-6)

1 Attach the AC power adaptor on to the connecting adaptor.
2 Connect the connecting adaptor to the TV with the supplied A/V connecting cable.
  [a] when your TV has phono type input jacks
  [b] when your TV has a 21-pin connector (EUROCONNECTOR)*
  *Use the supplied plug adaptor.
3 Attach the connecting plate of the connecting adaptor to the camcorder.
4 Plug the AC power adaptor into a wall outlet.
5 Set the CHARGE/VTR switch of the AC power adaptor to VTR.
6 Turn on the TV and set its input selector to VIDEO if available.

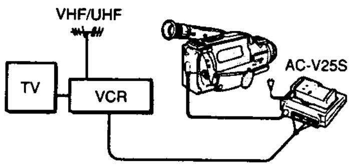
(O-7)


4
POWER CHARGE STANDBY VTR/DC OUT
2
to VIDEO OUT
to AUDIO (L, R) OUT
3
VHF/UHF
5
[b]
VIDEO
AUDIO
to VIDEO IN
to AUDIO (L, R) IN
1

A/V connecting cable supplied

: Signal flow

(O-8)

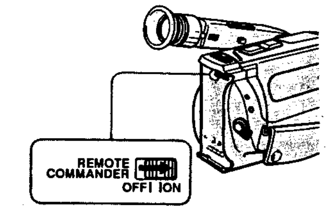

VHF/UHF
TV
VCR
AC-V25S

Without the connecting adaptor (O-7)
(When using the camcorder with the AC power adaptor while on a trip, etc.)

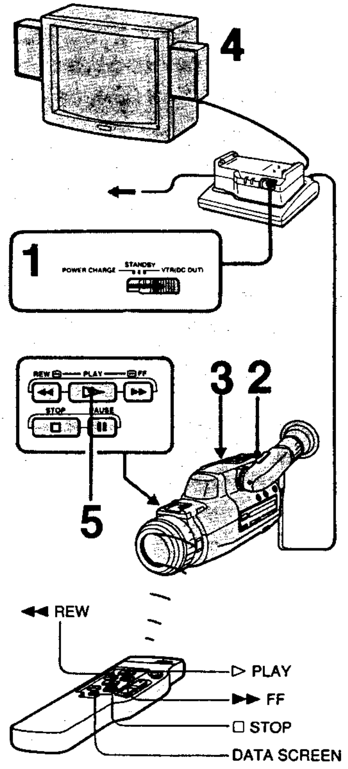
1 Connect the camcorder to the TV with the supplied A/V connecting cable.
  [a] when your TV has phono type input jacks.
  [b] when your TV has a 21-pin connector (EUROCONNECTOR)*
  *Use the supplied plug adaptor.
2 Attach the AC power adaptor to the camcorder.
3 Plug the AC power adaptor into a wall outlet.
4 Set the CHARGE/VTR switch of the AC power adaptor to VTR.
5 Turn on the TV and set its input selector to VIDEO.

Connecting the camcorder to a TV via a VTR (O-8)
Connect the AC power adaptor (with the connecting adaptor) to the VTR instead of the TV. Set the input selector of the VTR to LINE if available.

(P-1)



(P-2)



Playing Back a Tape

The supplied wireless Remote Commander is useful to control the camcorder from a distance. When using it, be sure to set the ■ REMOTE COMMANDER switch to ON. **(P-1)**

(P-2)

1. **Set the CHARGE/VTR switch on the AC power adaptor to VTR.**
2. **Press the small green button on the POWER switch and set it to PLAYER.**
3. **Insert a tape.**
4. **Turn on the TV (or the VTR).**
   - For a TV with video/audio input jacks, set the TV/VIDEO selector to VIDEO.
   - For a TV without video/audio input jacks, turn to the television preset channel to watch the tape (see page 38 or 40).
5. **Press ▷ (PLAY).**
   Playback starts.

To stop playback, press □ (STOP).

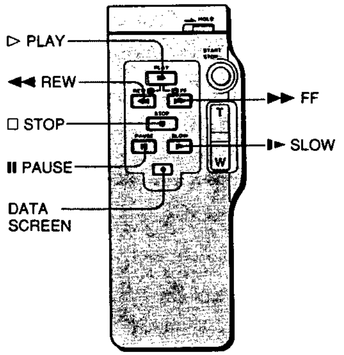
To rewind the tape, press ◀◀ (REW).

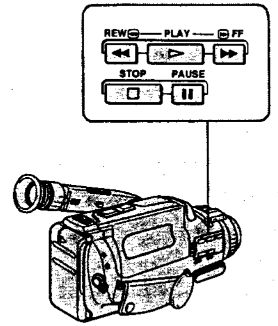
To advance the tape rapidly, press ▶▶ (FF).

To display the same indicators on the TV as in the viewfinder, press DATA SCREEN on the commander. To turn them off, press it again.

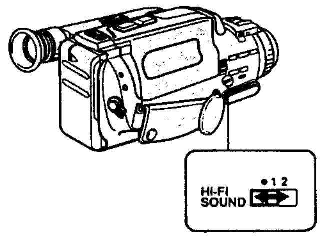
After playing back
Set the POWER switch on the camcorder to OFF and the CHARGE/VTR switch on the AC power adaptor to STANDBY.

(P-3)





(P-4)



Various Playback Modes

(P-3)

To view the still picture (playback pause), press **II** (PAUSE) during playback.
II appears in the viewfinder.
To resume normal playback, press ▷ (PLAY) or **II** (PAUSE).

Note
When the still picture mode lasts for 5 minutes or more, the camcorder automatically enters stop mode.

To view the picture at 1/5 speed (slow playback, only on the Commander), press **I▶** (SLOW) during playback.
I▶ appears in the viewfinder.

To resume normal playback, press ▷ (PLAY).

Note
When slow playback lasts for 1 minute or more, playback at the normal speed starts automatically.

To locate the desired scene (picture search), keep pressing ◀◀ (REW) or ▶▶ (FF) during playback or in the still picture mode. ⊖ or ⊕ appears in the viewfinder.
To resume normal playback, release the button.

To locate the desired scene quickly (skip scan),
press ◀◀ (REW) during rewinding or ▶▶ (FF) during advancing the tape rapidly. ⊖ or ⊕ appears in the viewfinder.
To resume normal playback, press ▷ (PLAY).

About the playback picture
During the various playback modes, streaks appear on the screen.

About the HOLD switch on the Commander
Slide it in the direction of the arrow when you want to prevent the buttons on the Commander from being accidentally pressed.

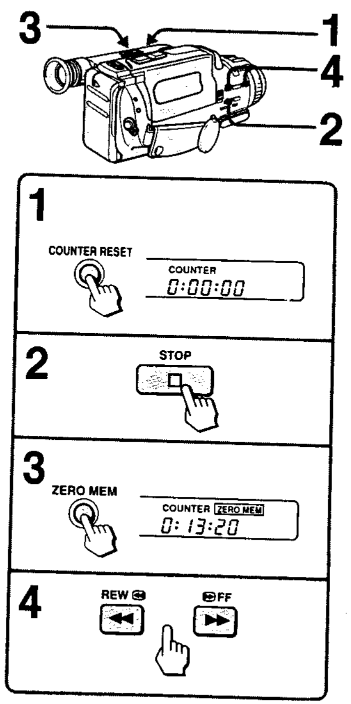
Playing Back a Tape with Dual Sound Tracks

(P-4)

Normally set the Hi-Fi SOUND switch to ● position.
When the tape with dual sound tracks is played, set the Hi-Fi SOUND switch to the desired sound, 1 or 2.

Note
When you connect to a TV using an RFU adaptor, or when the TV or VTR is a monaural type, set the Hi-Fi SOUND switch to 1 or 2.

(Q)



Using the Tape Counter

During recording or playback, the digits on the counter indicate the actual recording or playback time.

Counting the Whole Tape

Press COUNTER RESET at the beginning of the tape so that the counter shows "0:00:00".

Returning to a Pre-registered Point

(Q)

1 **During playback, press COUNTER RESET at the point you later want to locate. The counter shows "0:00:00".**

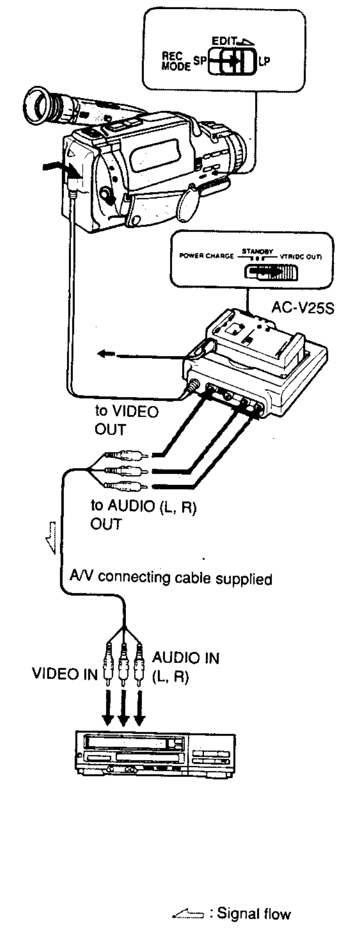
2 **Press □ (STOP) when the playback has finished, as usual.**

3 **Press ZERO MEM.**
The "ZERO MEM" indicator flashes in the display window.
Note
Be sure to press ZERO MEM after you stop the tape. It does not function during playback.

4 **Press ◀◀ (REW) or ▶▶ (FF).**
The tape rewinds or advances and stops automatically when the counter reaches approximately zero.

Notes on the tape counter and ZERO MEM button
- Something must be recorded on the tape in order for the tape counter to function. The tape counter will not work on blank tape.
- The counter reading and the point of the tape may not correspond exactly. Use the counter as a guide. There will be a time lag of several seconds especially when you repeat fast-forward running/rewinding and play back the tape recorded in LP and SP modes mixed.

(R)



Editing onto Another VTR

You can create your own video program by editing with any other 8 8-mm, β Betamax or VHS VHS format VTR.

Before You Begin

- Make connections using the supplied A/V connecting cable. **(R)**
- Set the input selector of the VTR to LINE, if available.

Operation

1 Insert a tape to be recorded on into the recording VTR.
2 Set the EDIT switch on the camcorder to the direction of the arrow (EDIT ON).
3 Set the CHARGE/VTR switch on the AC power adaptor to VTR.
4 Set the POWER switch of the camcorder to PLAYER and insert your recorded tape.
5 Play back the tape on the camcorder and locate the point where you wish to start editing and set the camcorder to the playback pause mode.
6 On the recording VTR, locate the recording starting point and set the VTR to the recording pause mode.
7 Press **II** (PAUSE) of both VTRs simultaneously to start editing.

To stop editing momentarily, press **II** (PAUSE) on the recording VTR.

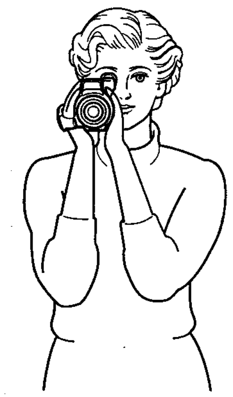
To edit more scenes, repeat steps 5 to 7.

To stop editing, press □ (STOP) on both the camcorder and the VTR.

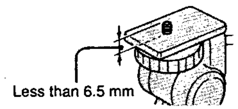
Use of the EDIT switch
When you set the EDIT switch to the direction of the arrow (EDIT ON), picture deterioration resulting from editing can be kept to the minimum. Avoid using the edited tape for multiple generations of editing. After editing, be sure to set this switch in the opposite direction of the arrow (EDIT OFF).

Note on DATA SCREEN function
If you have displayed the viewfinder indicators on the TV (DATA SCREEN function), erase them by pressing DATA SCREEN so that they will not be superimposed on the edited tape.

(S-1)



(S-2)



For Your Information

Hints for Better Shooting

Getting Stable Pictures

Take a good posture for shooting. (S-1)
For hand-held shots, it is important to hold the camcorder properly.

- Hold the camcorder firmly and secure it with the grip strap so that you can easily manipulate the camcorder with your thumb.
- Place your right elbow firmly against your side.
- Place your left hand under the camcorder to support it. When adjusting the focus manually, make sure the camcorder does not move.
- Place your eye firmly against the viewfinder eyecup.

Use a tripod.
If you have a tripod for a still camera, you can also use it with the camcorder. If a tripod is not available, try placing the camcorder on a tabletop or any other flat surface of suitable height.

Note (S-2)
When attaching a tripod other than Sony's, make sure that the length of the camera mounting screw is less than 6.5 mm. Otherwise, the screw may damage the inner parts of the camcorder.

Keep the horizontal plane level
The horizontal plane can be easily determined by using the viewfinder frame as a reference.

Lighting

Shoot with the sun behind you
When the light source is behind the subject, or in the following situations, the subject will be recorded too dark and the background too light.

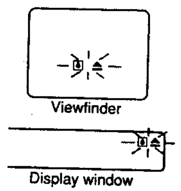
- The subject is indoors and there is a window behind the subject.
- Bright sources such as fluorescent or incandescent lamps are included in the scene.
- You are shooting a person wearing white or shiny clothes in front of a white background.
  In this case, the face will be recorded too dark.

Use video lights in the dark
To get the best colour, a sufficient light level must be maintained.
Photography lamps or halogen lamps are recommended. For best results, use of Sony video lights are recommended since their weight and low heat output levels allow safe, direct connection to the camcorder.
For detailed instructions on proper use of the light, read its instruction manual.

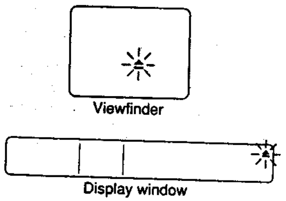
Brightness levels
Using the following chart as a reference, take a few minutes to familiarize yourself with brightness levels to improve your recording technique.

Situation	Brightness	Condition
Snow-covered mountains	Unit: lx	ND filter recom-mended
Snow fields		
Sandy beach, clear day in summer		
Clear day, mid day (100,000 lx)	100,000	Normal recording
Clear day, mid-afternoon (35,000)		
Overcast day, mid-day (32,000)		
	10,000	
Overcast day, one hour after sunrise (2,000)		
Office lit by fluorescent lamps, near window (1,000)		
Clear day, one hour before sunset (1,000)	1,000	
Department store counter (500 – 700)		
Station wicket (650)		
Office lit by fluorescent lamps (400 – 500)	500	
Room lit by two 30 W fluorescent lamps (300)	300	
Subway station platform (300)		
Arcade at night (150 – 200)		
	100	
Theater lobby (15 – 35)		Video light recom-mended
Candlelight (10 – 15)	10	

(T-1)



(T-2)



Notes and Precautions

Notes on Moisture Condensation

If the camcorder is brought directly from a cold place to a warm place, moisture may condense inside the camcorder, on the surface of the tape or on the lens. In this condition, the tape may stick to the head drum and be damaged or the unit may not operate correctly. To prevent possible damage under these circumstances, the camcorder is furnished with moisture sensors. However, take the following precautions.

If moisture condenses inside the unit

(T-1)

Moisture is present inside the camcorder when:

- the ▣ indication in the viewfinder and the display window flashes.
  When the tape is inserted, the ⏏ indicator also flashes.
- beeps sound continuously for about 5 seconds when the BEEP switch is set to ON.

In such cases, no function except for tape ejection will work.
Eject the tape, turn off the camcorder, and leave it with the cassette holder open for at least 1 hour.
The camcorder can be used again if the ▣ indicator does not appear when the power is turned on again.

If moisture condenses on the surface of the tape

(T-2)

Moisture is present on the surface of the tape when:

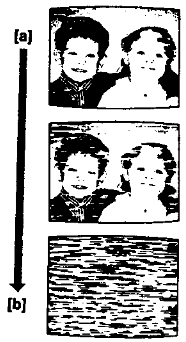
- The ⏏ indicator flashes inside the viewfinder and the display window when the tape is inserted and a tape transport button (▷, ◀◀ etc.) is pressed.
- Beeps sound continuously for about 5 seconds when the BEEP switch is set to ON.

In such cases, no function except for tape ejection, work.
Eject the tape and let it sit for at least 1 hour.
The tape can be used again if the ⏏ indicator does not appear when the tape is inserted and a tape transport button is pressed.

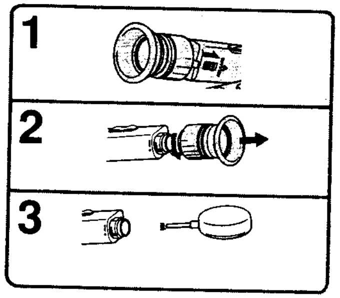
If moisture condenses on the lens

No caution indicators will appear, but the picture becomes dim.
Turn off the power and do not use the camcorder for at least 1 hour.

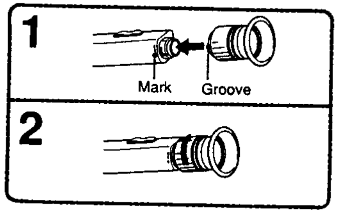
(T-3)



(T-4)



(T-5)



How to prevent moisture condensation

When bringing the camcorder from a cold place to a warm place, put the camcorder in a plastic bag and allow it to adapt to room conditions over a period of time.

1 Be sure to tightly seal the plastic bag containing the camcorder.
2 Remove the bag when the air temperature inside it has reached the temperature surrounding it (after about one hour).

Notes on Video Head Cleaning

(T-3)

To ensure clear picture, clean the video heads periodically.
When playback pictures are noisy or hardly visible, the video heads may be contaminated.
[a] Slight contamination
[b] Critical contamination
In such cases,

1 Clean the video heads with the Sony V8-25CLH cleaning cassette (not supplied), referring to its instructions.
2 After cleaning, check if the picture is clear by recording or playing back with an ordinary tape.
3 If the picture is still noisy, repeat cleaning. (Do not repeat cleaning more than 5 times.)

Caution
Do not use a commercially available wet-type cleaning cassette. It may damage the video heads.

Note
If the V8-25CLH cleaning cassette is not available in your area, consult your Sony service facility.

Viewfinder Cleaning

(T-4)

1 **Pull down the switch on the viewfinder barrel.**

2 **Turn the eyecup in the direction of the arrow and detach it.**

3 **Clean the surface of the screen with a commercially available blower.**

Reattaching the eyecup (T-5)
1 Align the groove on the eyecup with the ● mark on the barrel.
2 Turn the eyecup in the opposite direction of the arrow.

Precautions

On operation

- Operate the camcorder on 6.0 V (battery pack), 7.5 V (AC power adaptor), or 9.0 V (alkaline batteries).
- For DC or AC operation, use the accessories recommended in this manual.
- Should any solid object or liquid fall into the casing, unplug the camcorder and have it checked by qualified personnel before operating it any further.
- Do not hold the camcorder by the viewfinder or the microphone.
- Avoid rough handling or mechanical shock. Be particularly careful of the lens.
- Keep the lens cap attached on the lens when not using the camera.
- Do not wrap up the camcorder and operate it because heat may build up internally.
- Keep the camcorder away from strong magnetic fields or mechanical vibration.
- **Do not let sand get into the camcorder.** When you use the camcorder on a sandy beach or dusty place, protect it from the sand or dust. Sand or dust may cause the unit to malfunction and sometimes the malfunction cannot be repaired.
- **Do not let the camcorder get wet.** Keep the camcorder from rain or sea water. It may cause malfunction and sometimes the malfunction cannot be repaired.

On care

- When the unit will not be used for a long time, periodically turn on the power, operate the camera section and player section and play back a tape for about 3 minutes.
- Clean the lens with a soft brush to remove dust. If there are fingerprints on it, remove them with a soft cloth.
  Clean the camcorder body with a dry, soft cloth, or a soft cloth lightly moistened with a mild detergent solution. Do not use any type of solvent which may damage the finish.

Notes on handling tapes

- Never insert anything in the small holes on the rear of the cassette. These holes are used to sense the type of tape, thickness of tape, or if red mark is exposed or covered,ect.

Using your Camcorder Abroad

Each country has its own electricity system and TV colour system. Before using your camcorder abroad, check the following points.

Power Sources

You can use your camcorder in any country with the supplied AC power adaptor within 110 V to 240 V AC, 50/60 Hz.

Differences in Colour Systems

This camcorder is a PAL system based camcorder. If you want to view the playback picture on a TV, it must be a PAL system based TV or a SECAM system based TV with PAL-SECAM transcoder. Check the following alphabetical list.

PAL system Countries
Australia, Austria, Belgium, China, Denmark, Finland, Germany (Former West Germany), Great Britain, Holland, Hong Kong, Italy, Kuwait, Malaysia, New Zealand, Norway, Portugal, Singapore, Spain, Sweden, Switzerland, Thailand, and others.

PAL-M system country
Brazil

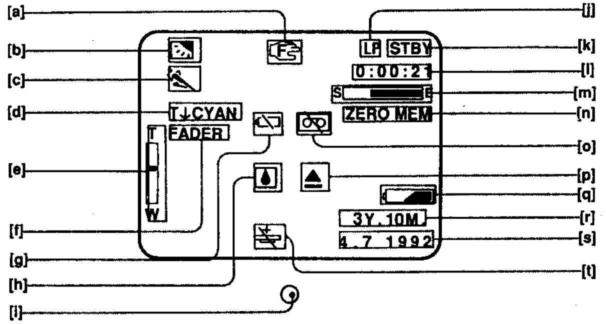
PAL-N system countries
Argentina, Paraguay, Uruguay

NTSC system countries
Bahama Islands, Canada, Central America, Japan, Korea, Mexico, Taiwan, The Philippines, U.S.A., and others.

SECAM system countries
Bulgaria, France, Hungary, Iran, Iraq, Monaco, Poland, former Soviet Union, and others.

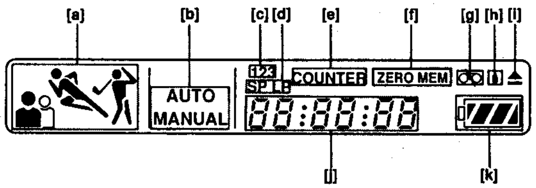
Indicators in the Viewfinder and the Display Window

In the Viewfinder



- **[a] Manual focusing**
- **[b] BACK LIGHT is pressed.**
- **[c] PROGRAM AE setting**
- **[d] Title mode and colour**
- **[e] Power zoom indicator**
- **[f] FADER is pressed.**
- **[g] "Exchange battery."**
- **[h] Moisture has condensed.**
- **[i] Lights up during recording.**
  When flashing:"Exchange battery or tape."
- **[j] Playback mode (LP, SP)**
- **[k] Tape transport mode**
- **[l] Tape counter**
- **[m] Remaining time of tape**
- **[n] ZERO MEM is pressed.**
- **[o] "Exchange tape or no tape inside."**
- **[p] "Trouble has occurred" (▲) "Clean video heads." (●)**
- **[q] Remaining capacity of a battery**
- **[r] Age**
- **[s] Date or Time**
- **[t] "Replace lithium battery"**

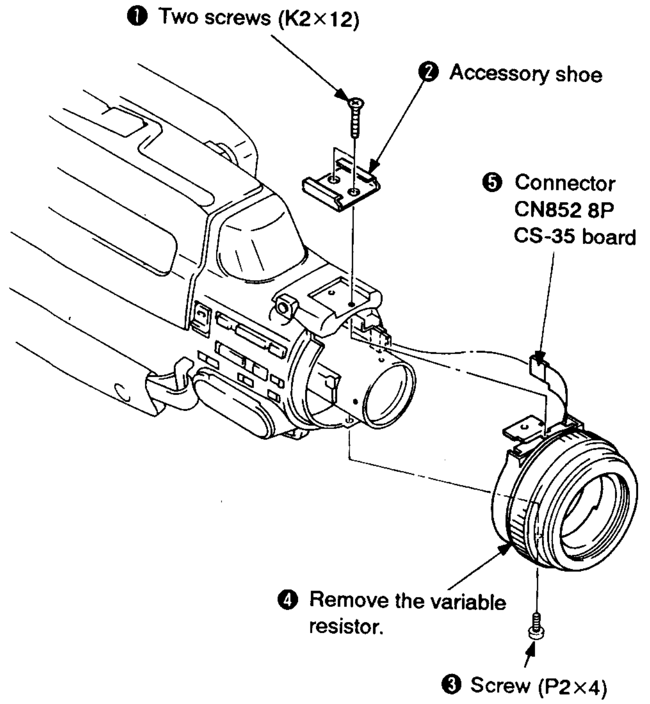
In the Display Window



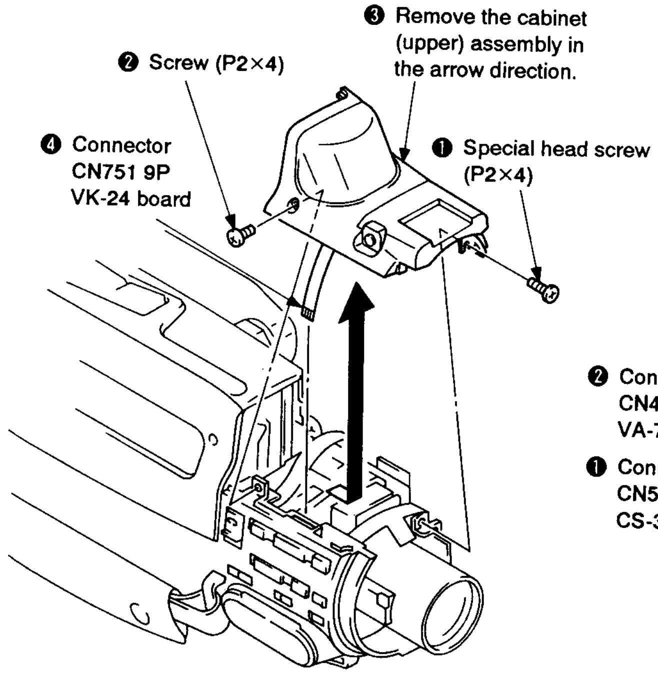
- **[a] PROGRAM AE setting**
- **[b] Forcus mode**
- **[c] AGE/EVENT memory number**
- **[d] Tape speed mode**
- **[e] Appears in counter mode**
- **[f] ZERO MEM is pressed.**
- **[g] "Replace the tape or no tape inside."**
- **[h] Moisture has condensed.**
- **[i] "Trouble has occurred"**
- **[j] Counter or time/date/age indicator**
- **[k] Remaining capacity of battery**

SECTION 2
DISASSEMBLY

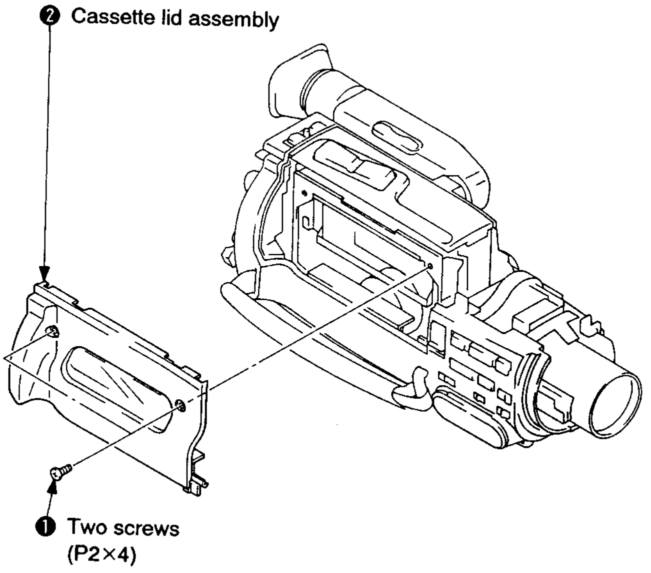
2-1. REMOVAL OF VARIABLE RESISTOR


❶ Two screws (K2×12)
❷ Accessory shoe
❺ Connector
CN852 8P
CS-35 board
❹ Remove the variable resistor.
❸ Screw (P2×4)

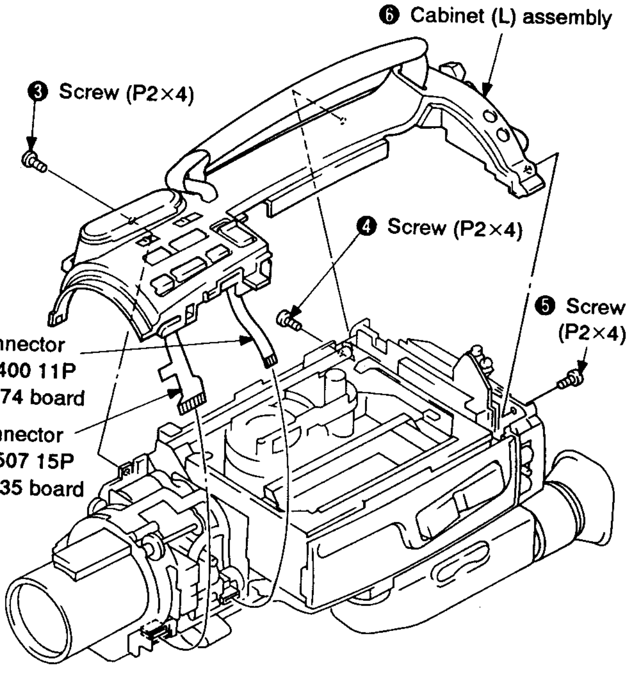
2-2. REMOVAL OF CABINET (UPPER) ASSEMBLY


❸ Remove the cabinet (upper) assembly in the arrow direction.
❷ Screw (P2×4)
❹ Connector
CN751 9P
VK-24 board
❶ Special head screw
(P2×4)

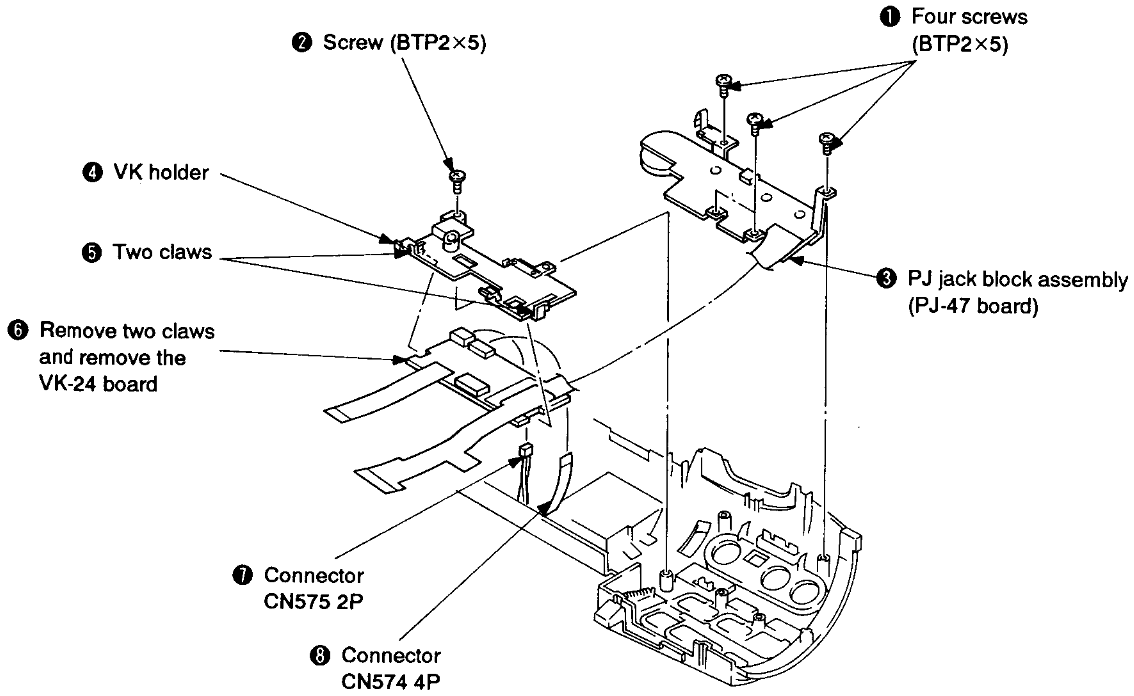
2-3. REMOVAL OF CASSETTE LID ASSEMBLY


❷ Cassette lid assembly
❶ Two screws
(P2×4)

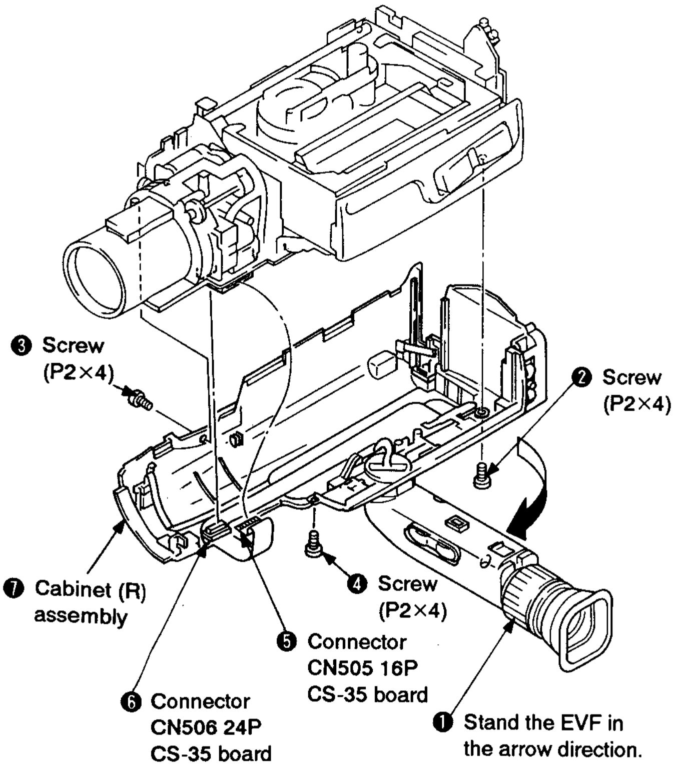
2-4. REMOVAL OF CABINET (L) ASSEMBLY


❻ Cabinet (L) assembly
❸ Screw (P2×4)
❹ Screw (P2×4)
❺ Screw
(P2×4)
❷ Connector
CN400 11P
VA-74 board
❶ Connector
CN507 15P
CS-35 board

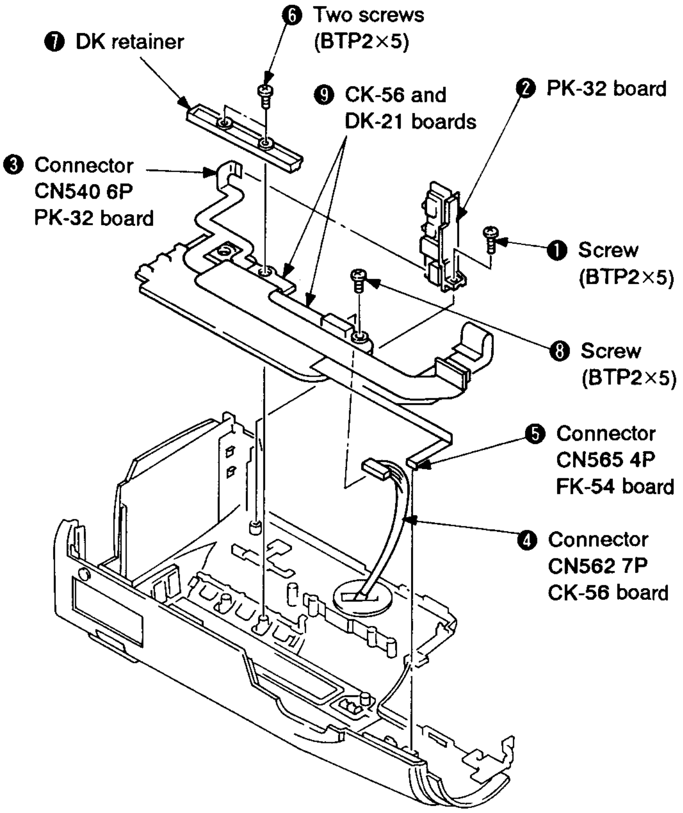
2-5. REMOVAL OF VK-24 AND PJ-47 BOARDS


❶ Four screws (BTP2×5)
❷ Screw (BTP2×5)
❸ PJ jack block assembly (PJ-47 board)
❹ VK holder
❺ Two claws
❻ Remove two claws and remove the VK-24 board
❼ Connector CN575 2P
❽ Connector CN574 4P

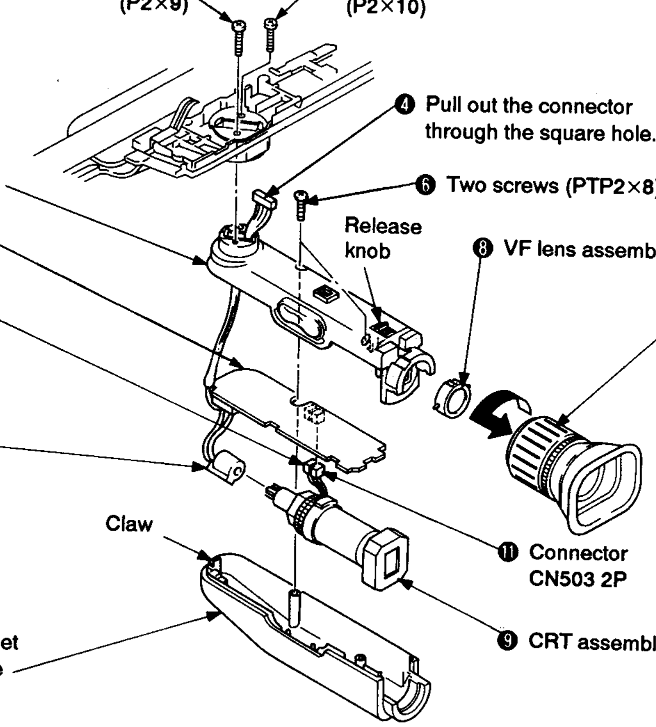
2-6. REMOVAL OF CABINET (R) ASSEMBLY


❶ Stand the EVF in the arrow direction.
❷ Screw (P2×4)
❸ Screw (P2×4)
❹ Screw (P2×4)
❺ Connector CN505 16P CS-35 board
❻ Connector CN506 24P CS-35 board
❼ Cabinet (R) assembly

2-7. REMOVAL OF CK-56, DK-21 AND PK-32 BOARDS


❶ Screw (BTP2×5)
❷ PK-32 board
❸ Connector CN540 6P PK-32 board
❹ Connector CN562 7P CK-56 board
❺ Connector CN565 4P FK-54 board
❻ Two screws (BTP2×5)
❼ DK retainer
❽ Screw (BTP2×5)
❾ CK-56 and DK-21 boards

2-8. REMOVAL OF EVF ASSEMBLY (VF-44 BOARD)



① Screw (P2×9)

② Screw (P2×10)

③ Remove the EVF assembly

④ Pull out the connector through the square hole.

⑤ Remove the finder holder block assembly in the arrow direction. (Slide the release knob. In this condition, rotate the fine holder to the marked line and remove it in the direction of the arrow.)

⑥ Two screws (PTP2×8)

⑦ Remove the EVF cabinet (R) by lifting up with the claw as it's fulcrum.

⑧ VF lens assembly

⑨ CRT assembly

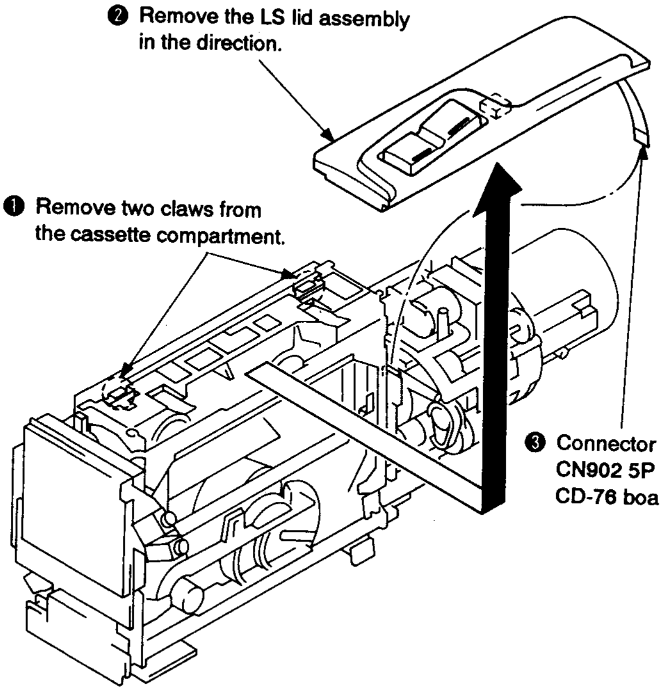
⑩ CRT socket

⑪ Connector CN503 2P

⑫ Connector CN502 2P

⑬ VF-44 board

2-9. REMOVAL OF LS LID ASSEMBLY

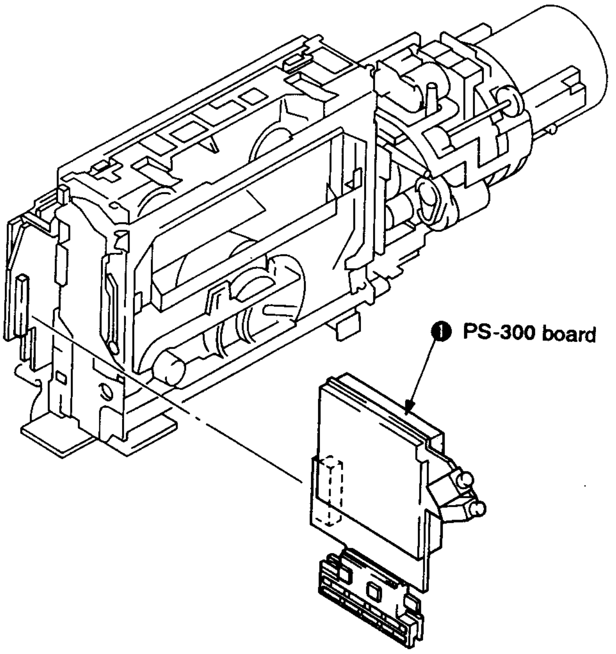


① Remove two claws from the cassette compartment.

② Remove the LS lid assembly in the direction.

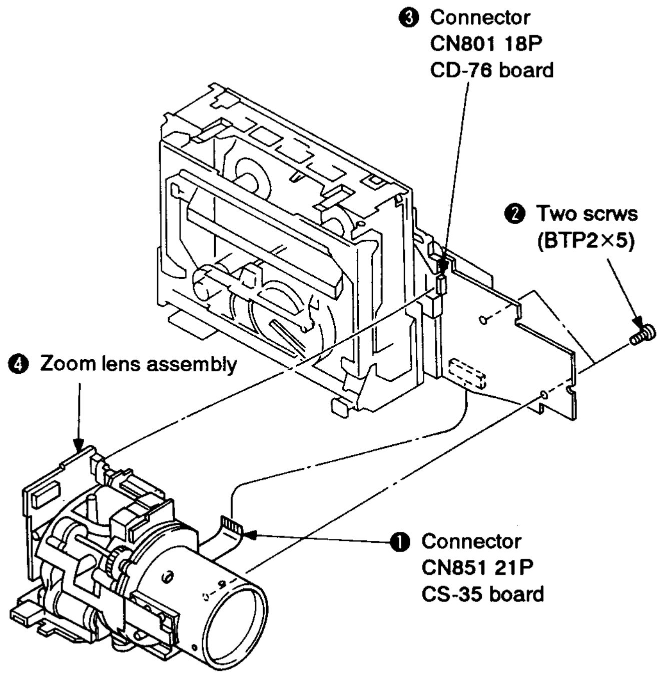
③ Connector CN902 5P CD-76 board

2-10. REMOVAL OF PS-300 BOARD

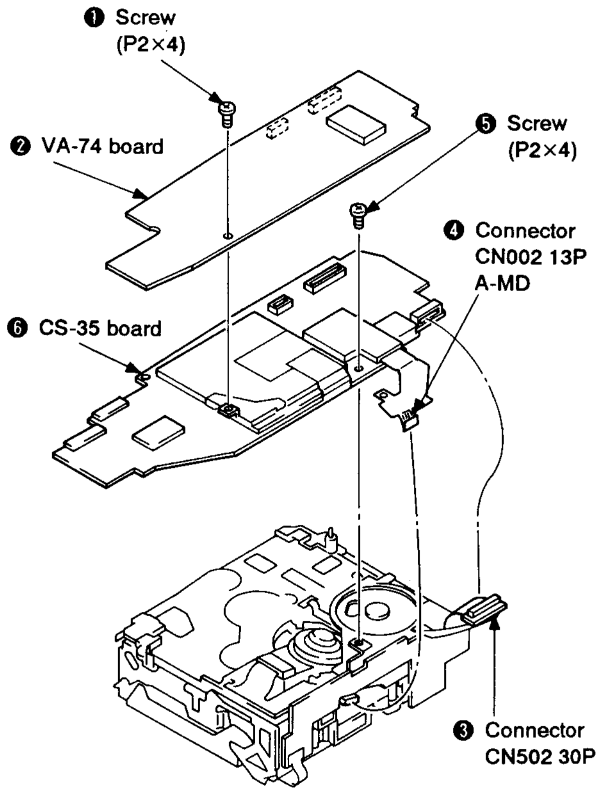


① PS-300 board

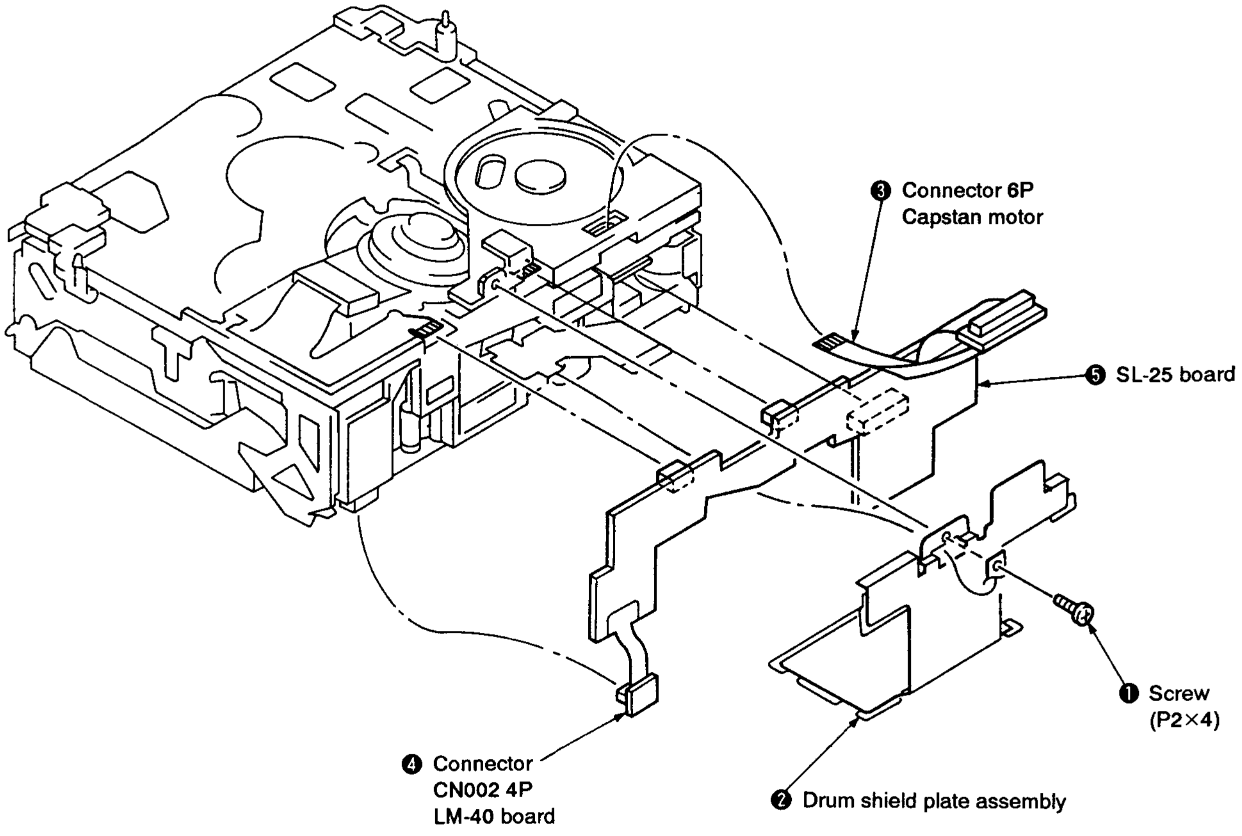
2-11. REMOVAL OF ZOOM LENS ASSEMBLY


❸ Connector
CN801 18P
CD-76 board
❷ Two scrws
(BTP2×5)
❹ Zoom lens assembly
❶ Connector
CN851 21P
CS-35 board

2-12. REMOVAL OF VA-74 AND CS-35 BOARDS

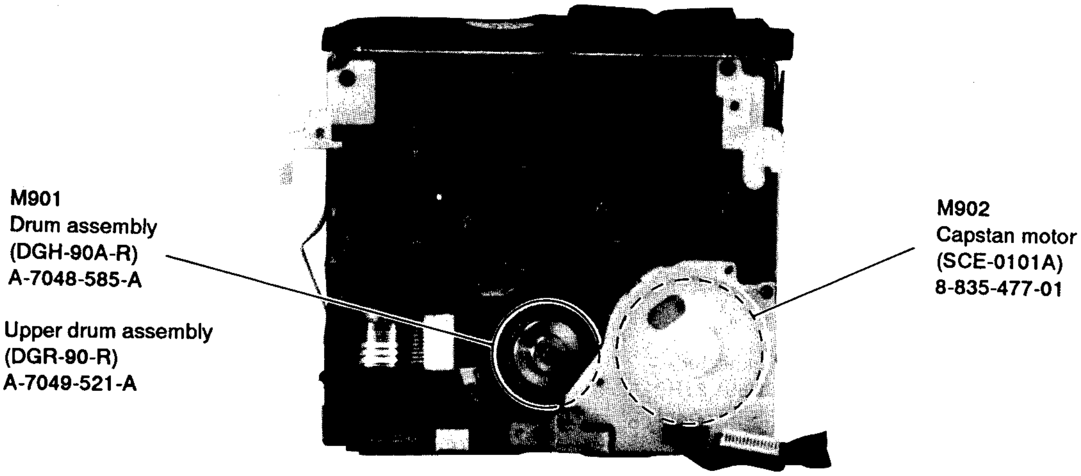

❶ Screw
(P2×4)
❷ VA-74 board
❺ Screw
(P2×4)
❹ Connector
CN002 13P
A-MD
❻ CS-35 board
❸ Connector
CN502 30P

2-13. REMOVAL OF SL-25 BOARD

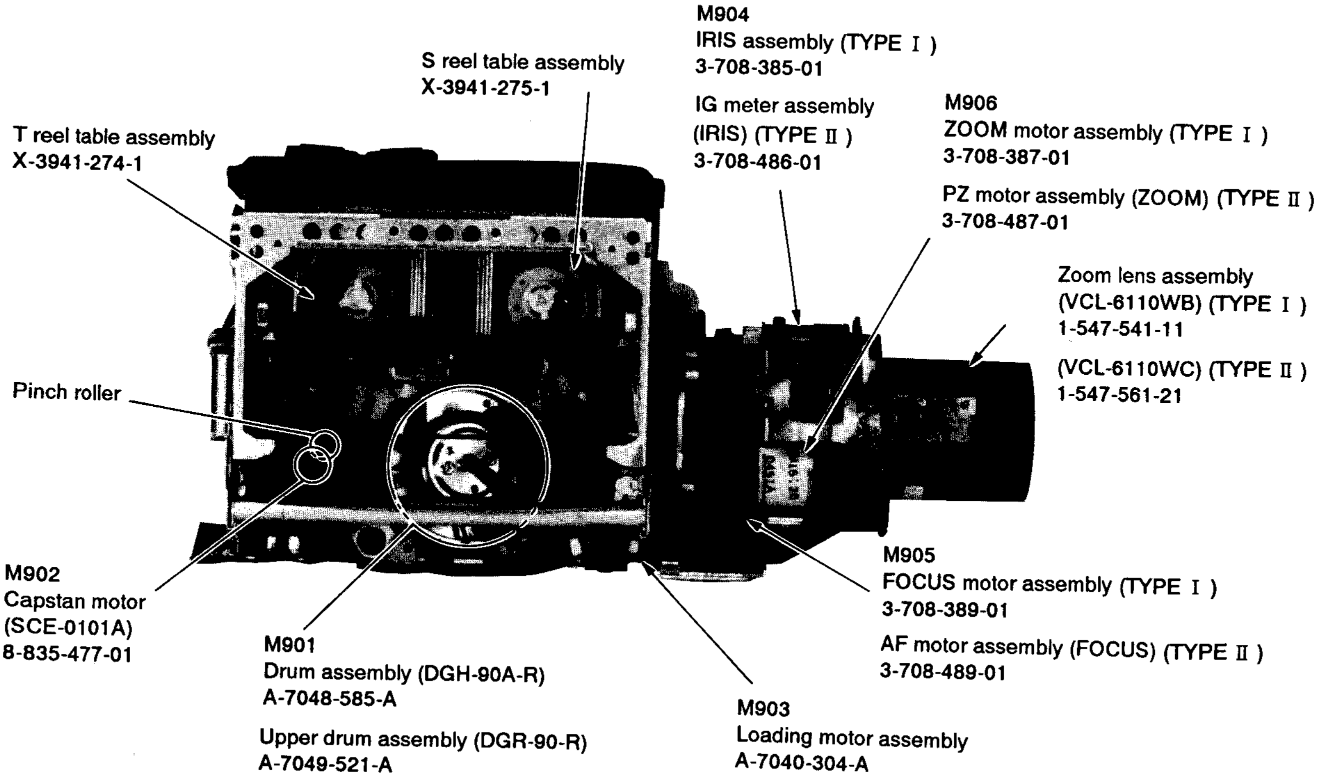

❸ Connector 6P
Capstan motor
❺ SL-25 board
❶ Screw
(P2×4)
❹ Connector
CN002 4P
LM-40 board
❷ Drum shield plate assembly

2-14. INTERNAL VIEWS

— Right side —

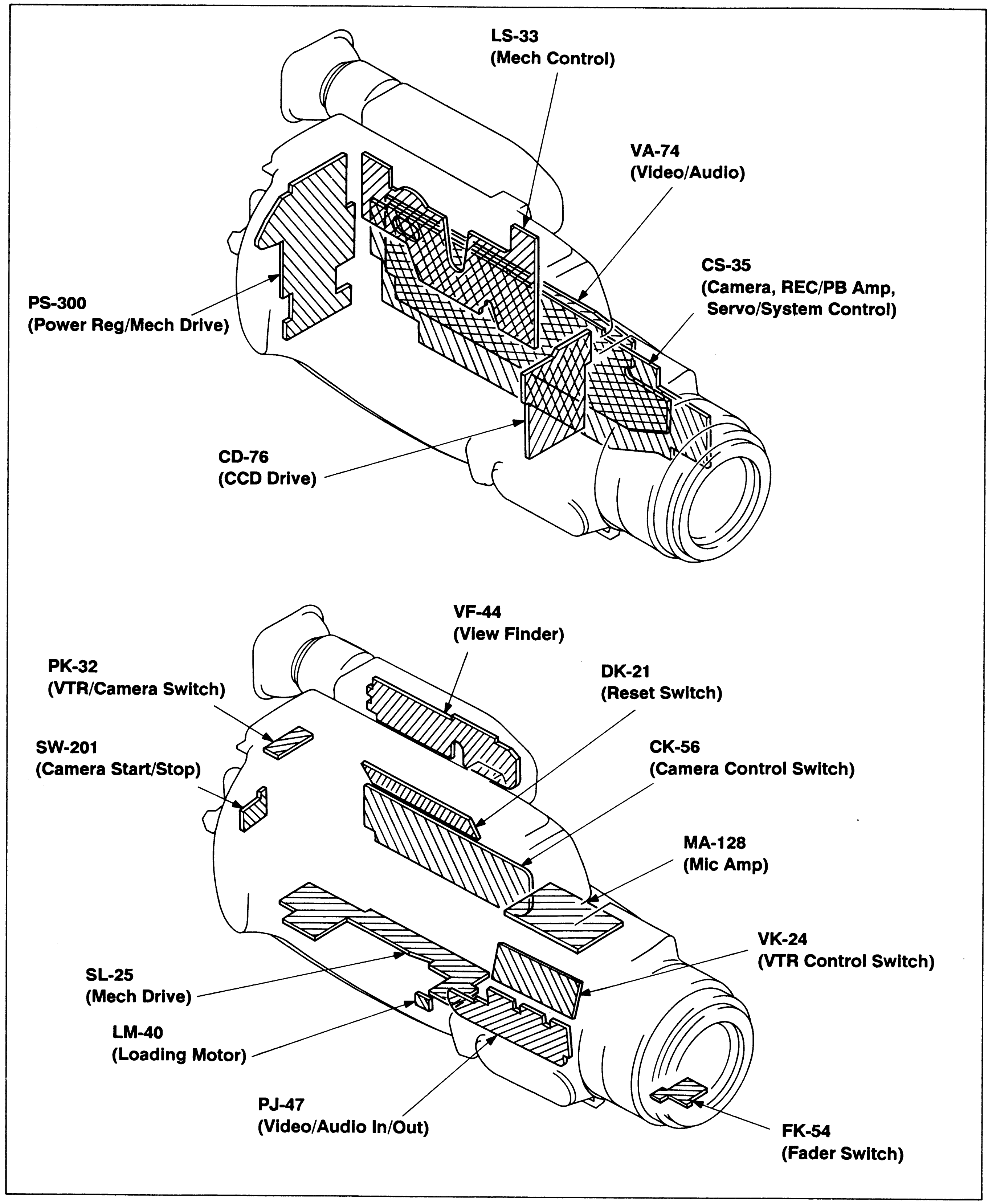

M901
Drum assembly
(DGH-90A-R)
A-7048-585-A
Upper drum assembly
(DGR-90-R)
A-7049-521-A
M902
Capstan motor
(SCE-0101A)
8-835-477-01

— Left side —

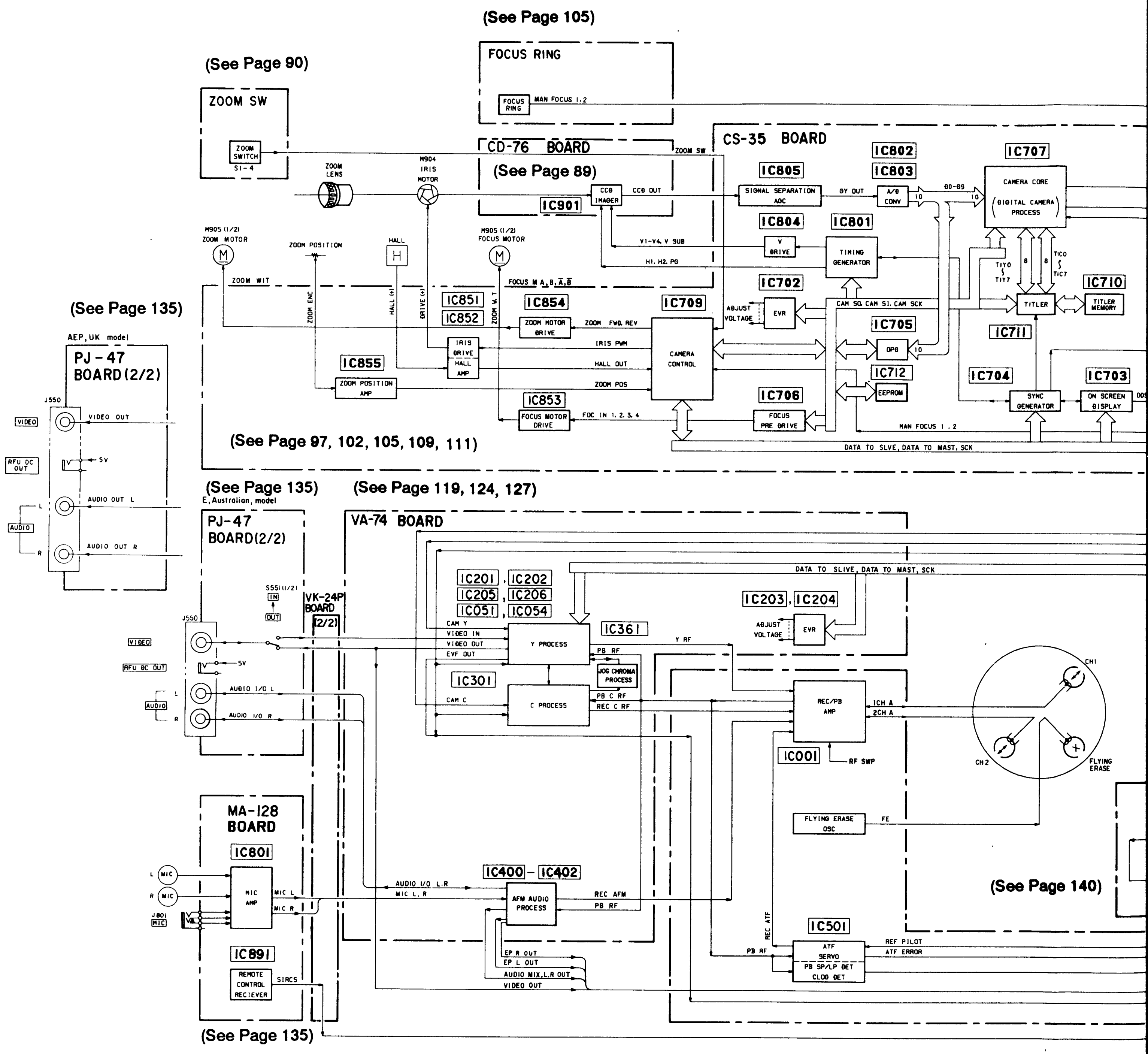

M904
IRIS assembly (TYPE Ⅰ)
3-708-385-01
IG meter assembly
(IRIS) (TYPE Ⅱ)
3-708-486-01
S reel table assembly
X-3941-275-1
T reel table assembly
X-3941-274-1
M906
ZOOM motor assembly (TYPE Ⅰ)
3-708-387-01
PZ motor assembly (ZOOM) (TYPE Ⅱ)
3-708-487-01
Zoom lens assembly
(VCL-6110WB) (TYPE Ⅰ)
1-547-541-11
(VCL-6110WC) (TYPE Ⅱ)
1-547-561-21
Pinch roller
M902
Capstan motor
(SCE-0101A)
8-835-477-01
M901
Drum assembly (DGH-90A-R)
A-7048-585-A
Upper drum assembly (DGR-90-R)
A-7049-521-A
M905
FOCUS motor assembly (TYPE Ⅰ)
3-708-389-01
AF motor assembly (FOCUS) (TYPE Ⅱ)
3-708-489-01
M903
Loading motor assembly
A-7040-304-A

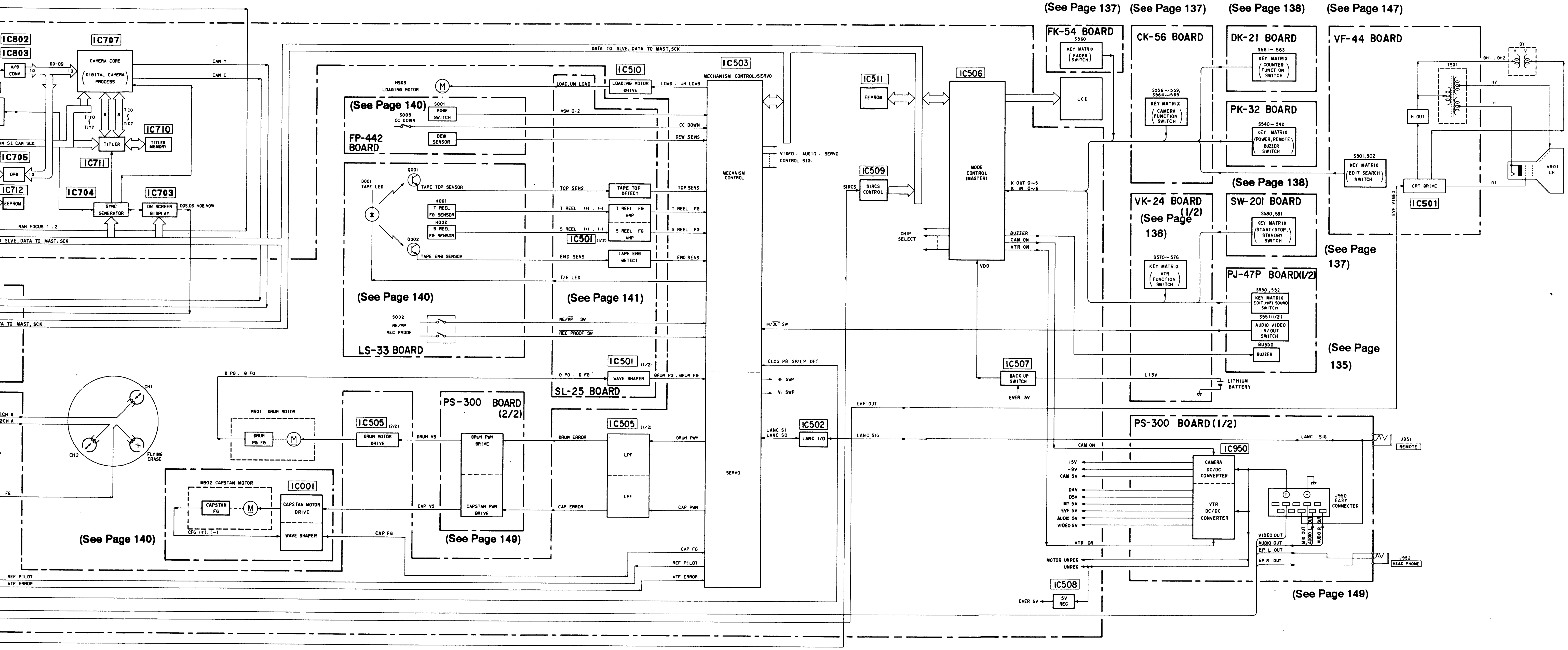
SECTION 3
DIAGRAMS

3-1. CIRCUIT BOARDS LOCATION

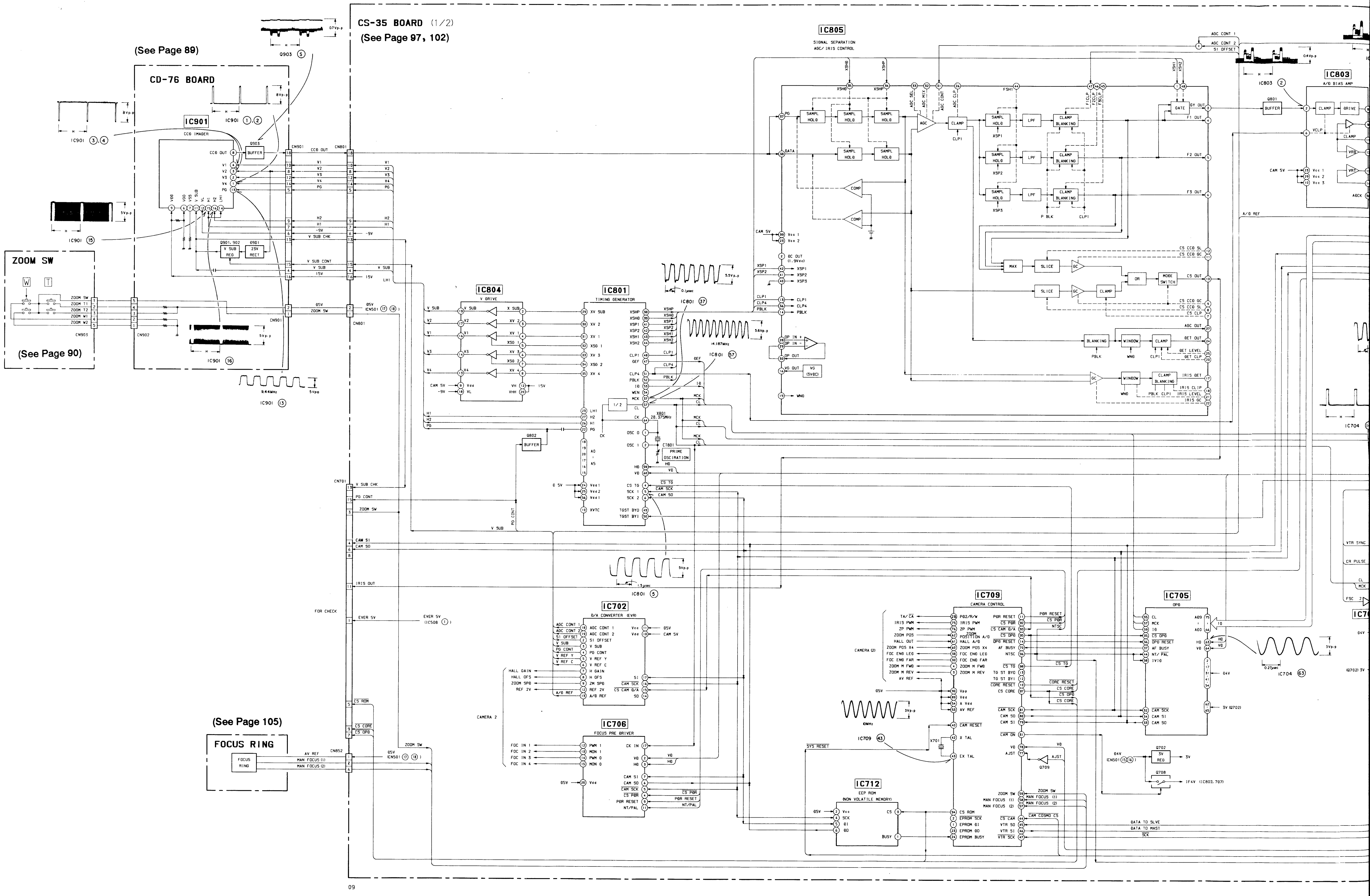

LS-33
(Mech Control)
VA-74
(Video/Audio)
CS-35
(Camera, REC/PB Amp, Servo/System Control)
PS-300
(Power Reg/Mech Drive)
CD-76
(CCD Drive)
VF-44
(View Finder)
PK-32
(VTR/Camera Switch)
DK-21
(Reset Switch)
SW-201
(Camera Start/Stop)
CK-56
(Camera Control Switch)
MA-128
(Mic Amp)
VK-24
(VTR Control Switch)
SL-25
(Mech Drive)
LM-40
(Loading Motor)
PJ-47
(Video/Audio In/Out)
FK-54
(Fader Switch)

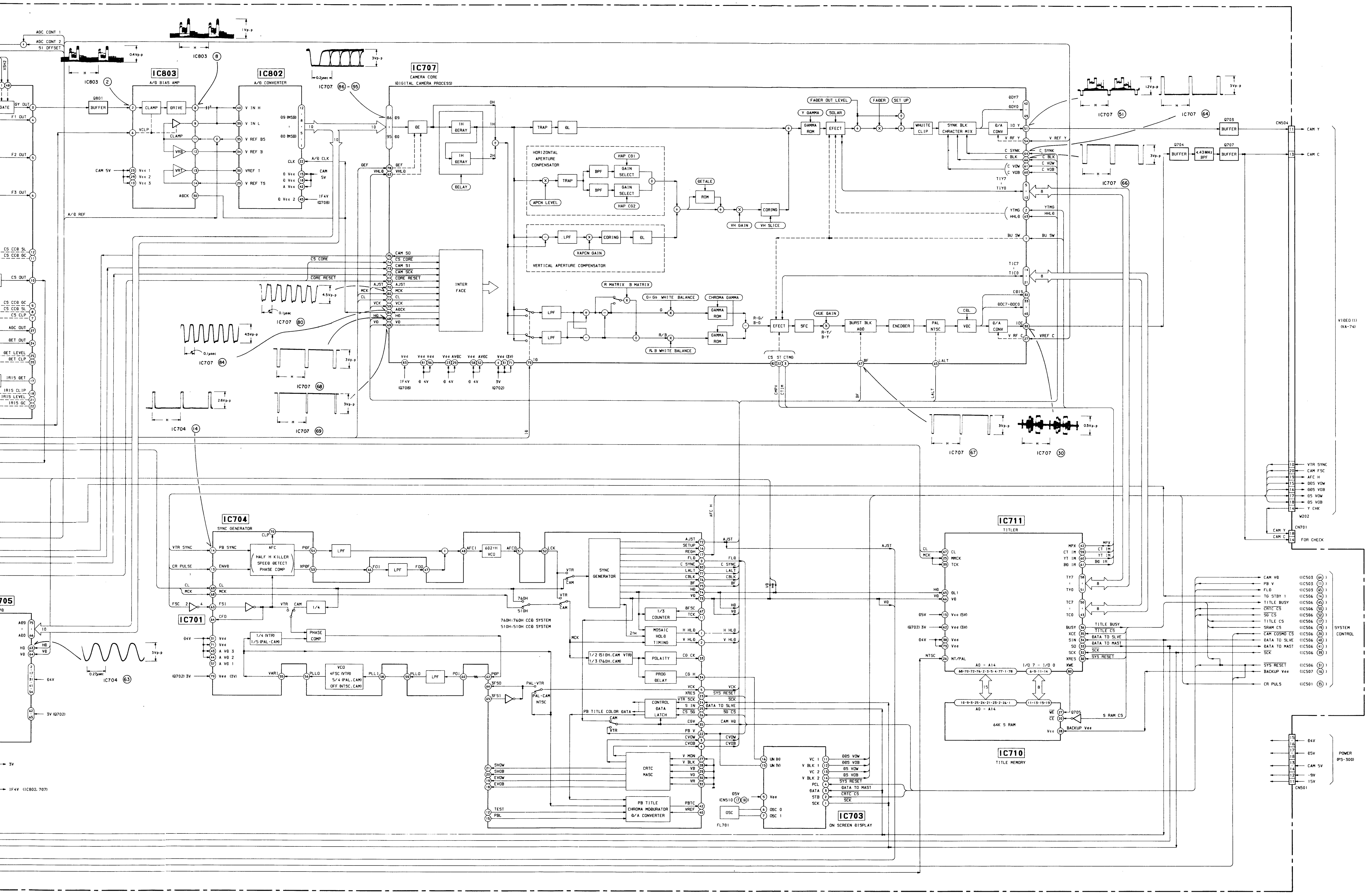
3-2. OVERALL BLOCK DIAGRAM


(See Page 105)
FOCUS RING
(See Page 90)
ZOOM SW
ZOOM SWITCH S1-4
CD-76 BOARD
(See Page 89)
IC901
CCD IMAGER
CCD OUT
CS-35 BOARD
IC802
IC803
IC805
IC804
IC801
IC707
CAMERA CORE
DIGITAL CAMERA PROCESS
SIGNAL SEPARATION ADC
A/D CONV
Y DRIVE
TIMING GENERATOR
IC702
EVR
IC705
DPG
IC712
EEPROM
IC706
FOCUS PRE DRIVE
IC709
CAMERA CONTROL
IC710
TITLER MEMORY
TITLER
IC711
IC704
SYNC GENERATOR
IC703
ON SCREEN DISPLAY
IC851
IC852
IC854
ZOOM MOTOR DRIVE
IRIS DRIVE
HALL AMP
IC855
ZOOM POSITION AMP
IC853
FOCUS MOTOR DRIVE
ZOOM LENS
M904 IRIS MOTOR
M905 (1/2) ZOOM MOTOR
M905 (1/2) FOCUS MOTOR
ZOOM POSITION
HALL
(See Page 135)
AEP, UK model
PJ-47 BOARD (2/2)
J550
VIDEO
RFU DC OUT
AUDIO
VIDEO OUT
AUDIO OUT L
AUDIO OUT R
(See Page 97, 102, 105, 109, 111)
(See Page 135)
E, Australian, model
PJ-47 BOARD(2/2)
(See Page 119, 124, 127)
VA-74 BOARD
VK-24P BOARD (2/2)
S551(1/2)
IN
OUT
IC201, IC202
IC205, IC206
IC051, IC054
IC361
Y PROCESS
JOG CHROMA PROCESS
IC301
C PROCESS
IC203, IC204
EVR
DATA TO SLIVE, DATA TO MAST, SCK
REC/PB AMP
1CH A
2CH A
IC001
RF SWP
FLYING ERASE OSC
FE
CH1
CH2
FLYING ERASE
(See Page 140)
MA-128 BOARD
IC801
MIC AMP
MIC L
MIC R
J801 MIC
IC891
REMOTE CONTROL RECIEVER
SIRCS
IC400 - IC402
AFM AUDIO PROCESS
REC AFM
PB RF
IC501
ATF SERVO
PB SP/LP DET
CLOG DET
REF PILOT
ATF ERROR
(See Page 135)


IC802
IC803
IC707
CAMERA CORE
DIGITAL CAMERA PROCESS
CAM Y
CAM C
A/D CONV
IC705
IC712
EEPROM
IC711
TITLER
IC710
TITLER MEMORY
IC704
SYNC GENERATOR
IC703
ON SCREEN DISPLAY
MAN FOCUS 1 . 2
DATA TO SLVE, DATA TO MAST, SCK
IC510
LOADING MOTOR DRIVE
M903 LOADING MOTOR
IC503
MECHANISM CONTROL/SERVO
MECANISM CONTROL
SERVO
(See Page 140)
S001 MODE SWITCH
S005 CC DOWN
DEW SENSOR
FP-442 BOARD
D001 TAPE LED
Q001 TAPE TOP SENSOR
H001 T REEL FG SENSOR
H002 S REEL FG SENSOR
Q002 TAPE END SENSOR
TAPE TOP DETECT
T REEL FG AMP
S REEL FG AMP
IC501 (1/2)
TAPE END DETECT
T/E LED
(See Page 140)
(See Page 141)
S002 ME/MP REC PROOF
LS-33 BOARD
IC501 (1/2)
WAVE SHAPER
SL-25 BOARD
VIDEO . AUDIO . SERVO CONTROL SIG.
IN/OUT SW
CLOG PB SP/LP DET
RF SWP
VI SWP
IC511
EEPROM
IC509
SIRCS CONTROL
IC506
MODE CONTROL (MASTER)
LCD
CHIP SELECT
K OUT 0~5
K IN 0~6
BUZZER
CAM ON
VTR ON
VDD
IC507
BACK UP SWITCH
EVER 5V
LITHIUM BATTERY
IC502
LANC I/O
LANC SI
LANC SO
LANC SIG
EVF OUT
M901 DRUM MOTOR
DRUM PG. FG
IC505 (2/2)
DRUM MOTOR DRIVE
PS-300 BOARD (2/2)
DRUM PWM DRIVE
CAPSTAN PWM DRIVE
IC505 (1/2)
LPF
DRUM ERROR
DRUM PWM
CAP ERROR
CAP PWM
CAP FG
REF PILOT
ATF ERROR
M902 CAPSTAN MOTOR
CAPSTAN FG
IC001
CAPSTAN MOTOR DRIVE
WAVE SHAPER
CFG (+). (-)
(See Page 140)
(See Page 149)
CH1
CH2
FLYING ERASE
FE
(See Page 137)
FK-54 BOARD
S560 KEY MATRIX (FADER SWITCH)
(See Page 137)
CK-56 BOARD
S556~559, S564~569 KEY MATRIX (CAMERA FUNCTION SWITCH)
(See Page 138)
DK-21 BOARD
S561~563 KEY MATRIX (COUNTER FUNCTION SWITCH)
PK-32 BOARD
S540~542 KEY MATRIX (POWER, REMOTE BUZZER SWITCH)
(See Page 138)
VK-24 BOARD (1/2)
(See Page 136)
S570~576 KEY MATRIX (VTR FUNCTION SWITCH)
SW-201 BOARD
S580, 581 KEY MATRIX (START/STOP, STANDBY SWITCH)
PJ-47P BOARD (1/2)
S550, 552 KEY MATRIX EDIT, HiFi SOUND SWITCH
S551 (1/2) AUDIO VIDEO IN/OUT SWITCH
BU550 BUZZER
(See Page 137)
(See Page 135)
(See Page 147)
VF-44 BOARD
S501, 502 KEY MATRIX (EDIT SEARCH SWITCH)
H OUT
T501
DY
CRT DRIVE
IC501
V901 CRT
EVF VIDEO
PS-300 BOARD (1/2)
IC950
CAMERA DC/DC CONVERTER
VTR DC/DC CONVERTER
15V
-9V
CAM 5V
D4V
D5V
MT 5V
EVF 5V
AUDIO 5V
VIDEO 5V
CAM ON
VTR ON
MOTOR UNREG
UNREG
IC508
5V REG
EVER 5V
J950 EASY CONNECTER
VIDEO OUT
AUDIO OUT
EP L OUT
EP R OUT
J951 REMOTE
J952 HEAD PHONE
(See Page 149)

3-3. CAMERA (1) BLOCK DIAGRAM


(See Page 89)
CD-76 BOARD
IC901
CCD IMAGER
CCD OUT
BUFFER
Q903
V SUB REG
Q901, 902
23V RECT
Q901
IC901 ①,②
IC901 ③,④
IC901 ⑮
IC901 ⑯
IC901 ⑬
Q903 ⑤
9.44MHz
ZOOM SW
W
T
CN903
CN902
CN901
(See Page 90)
CS-35 BOARD (1/2)
(See Page 97, 102)
CN801
CN701
IC804
V DRIVE
IC801
TIMING GENERATOR
IC801 ㊲
IC801 (57)
IC801 ⑤
14.187MHz
X801 28.375MHz
CT801 PRIME OSCIRATION
Q802 BUFFER
IC805
SIGNAL SEPARATION AGC/IRIS CONTROL
SAMPL HOLD
AGC
CLAMP
LPF
CLAMP BLANKING
COMP
MAX
SLICE
GC
OR
MODE SWITCH
BLANKING
WINDOW
GATE
IC803
A/D BIAS AMP
Q801 BUFFER
CLAMP
DRIVE
IC702
D/A CONVERTER (EVR)
IC706
FOCUS PRE DRIVER
IC709
CAMERA CONTROL
IC709 (63)
X701
10MHz
Q709
IC712
EEP ROM (NON VOLATILE MEMORY)
IC705
OPD
IC704 (63)
Q702 3V REG
Q708
IF4V (IC802, 707)
CAMERA (2)
CAMERA 2
FOR CHECK
EVER 5V (IC508 ①)
(See Page 105)
FOCUS RING
CN852
AV REF
MAN FOCUS (1)
MAN FOCUS (2)
ZOOM SW
DATA TO SLVE
DATA TO MAST
SCK
SYS RESET
VTR SYNC
CR PULSE
09


IC803
A/D BIAS AMP
IC802
A/D CONVERTER
IC707
CAMERA CORE
(DIGITAL CAMERA PROCESS)
IC704
SYNC GENERATOR
IC701
IC711
TITLER
IC710
TITLE MEMORY
IC703
ON SCREEN DISPLAY
AGC CONT 1
AGC CONT 2
S1 OFFSET
Q801
BUFFER
CLAMP
DRIVE
V IN H
V IN L
V REF BS
V REF B
VREF T
V REF TS
CLK
A/D CLK
CAM 5V
A/D REF
HORIZONTAL APERTURE COMPENSATOR
VERTICAL APERTURE COMPENSATOR
APCN LEVEL
VAPCN GAIN
HAP CG1
HAP CG2
GAIN SELECT
BPF
LPF
TRAP
CORING
DETAIL
ROM
VH GAIN
VH SLICE
1H DELAY
DELAY
GAMMA ROM
Y GAMMA
SOLAR
EFECT
FADER OUT LEVEL
FADER
SET UP
WHITE CLIP
SYNC BLK CHARACTER MIX
D/A CONV
R MATRIX B MATRIX
G/Gb WHITE BALANCE
CHROMA GAMMA
R/B WHITE BALANCE
HUE GAIN
BURST BLK ADD
ENCODER
PAL NTSC
CGL
INTER FACE
CAM SO
CS CORE
CAM SI
CAM SCK
CORE RESET
AJST
MCK
CL
VCK
AGCK
HD
VD
Q703
BUFFER
Q704
4.43MHz BPF
Q707
CN504
CAM Y
CAM C
VIDEO (1) (VA-74)
VTR SYNC
CAM FSC
AFC H
DDS VDW
DDS VDB
DS VDW
DS VDB
Y CHK
W202
CN701
FOR CHECK
AFC
HALF H KILLER
SPEED DETECT
PHASE COMP
SYNC GENERATOR
VCO
6021H
1/3 COUNTER
MOSAIC HOLD TIMING
POLARITY
PROG DELAY
CONTROL DATA LATCH
CRTC MASC
PB TITLE CHROMA MODURATOR D/A CONVERTER
760H:760H CCD SYSTEM
510H:510H CCD SYSTEM
4FSC (VTR)
5/4 (PAL.CAM)
OFF (NTSC.CAM)
PHASE COMP
1/4 (VTR)
1/5 (PAL-CAM)
VTR SYNC
CR PULSE
FSC
OSC
FL701
64K S RAM
Q705
S RAM CS
BACKUP Vdd
A0 – A14
I/O 7 – I/O 0
CAM VD
PB V
FLD
TG STBY 1
TITLE BUSY
CRTC CS
SG CS
TITLE CS
SRAM CS
CAM COSMO CS
DATA TO SLVE
DATA TO MAST
SCK
SYS RESET
BACKUP Vdd
CR PULS
SYSTEM CONTROL
D4V
D5V
CAM 5V
-9V
15V
POWER (PS-30)
CN501
IC803 (2)
IC803 (8)
IC707 (86)-(95)
IC707 (80)
IC707 (84)
IC707 (68)
IC707 (69)
IC704 (14)
IC704 (63)
IC707 (51)
IC707 (64)
IC707 (66)
IC707 (67)
IC707 (30)
1Vp-p
0.4Vp-p
3Vp-p
4.5Vp-p
2.6Vp-p
1.2Vp-p
0.5Vp-p
0.2μsec
0.1μsec
0.27μsec

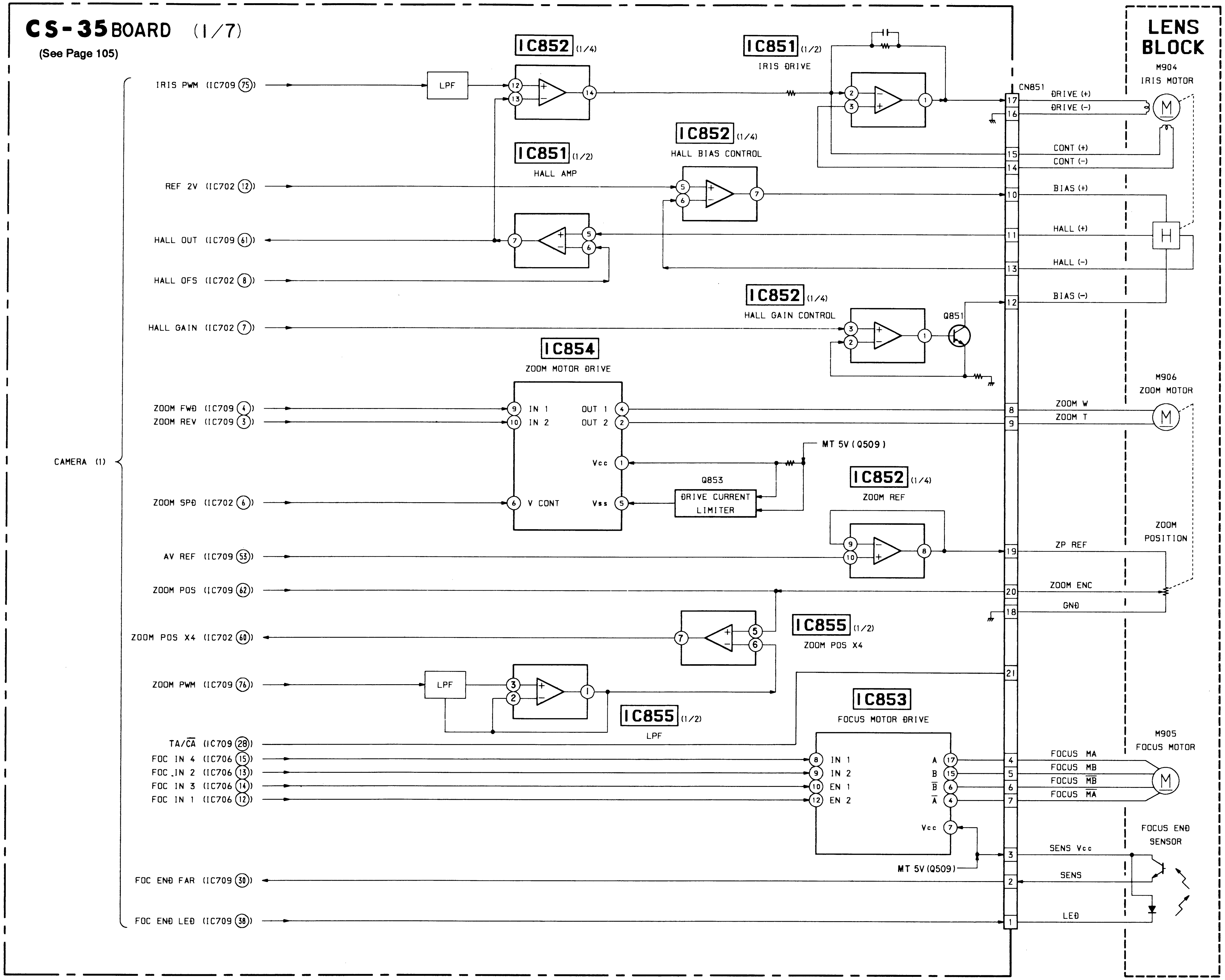
3-4. CAMERA MICROPROCESSOR PIN FUNCTION (IC709 ON CS-35 BOARD: CXP80624-299Q)

Pin No.	Signal	I/O	Function
1	EPROM DI	O	Not used.
2	$\overline{\text{EPROM SCK}}$	O	
3	ZOOM M REV	O	Zoom motor control signal. Normally "H". 16.6 msec period PWM signal when rotating to WIDE.
4	ZOOM M FWD	O	Zoom motor control signal. Normally "H". 16.6 msec period PWM signal when rotating to TELE.
5	PB1		Not used.
6	PB0		
7	RT07/D7		
8	RT06/D6		
9	RT05/D5		
10	$\overline{\text{CORE RESET}}$	O	Camera core (IC707 on CS-35 board) reset signal. Normally "H". "L" when reset.
11	PDR RESET	O	Focus predriver (IC706 on CS-35 board) reset signal. Normally "H". "L" when reset.
12	TG STBY1		Not used.
13	TG STBY2		
14	$\overline{\text{OPD RESET}}$	O	OPD (IC705 on CS-35 board) reset signal. "H": camera mode. "L": VTR mode.
15	PJ7/FSEL31		Not used.
16	PJ6/FSEL30		
17	PJ5/FSEL21		
18	PJ4/FSEL20		
19	PJ3/FSEL11		
20	PJ2/FSEL10		
21	PJ1/FSEL01		
22	PJ0/FSEL00		
23	EPROM DO	O	
24	$\overline{\text{EPROM BUSY}}$	I	BUSY signal from EEPROM. Normally "H". "L" pulse when data reading/writing.
25	FOC NEAR		Not used.
26	FOC FAR		
27	PD3/C	I	Fixed to +5V.
28	TA/$\overline{\text{CA}}$	I	
29	WIDE END		Fixed to +5V.
30	FOC END FAR	I	Focus end FAR sensor input. Normally "L".
31	$\overline{\text{CAM ON}}$	O	Power supply control signal. Normally "L".
32	PH6		Not used.
33	PH5		
34	PH4		
35	PH3		
36	PH2		
37	PH1		
38	FOC END LED	O	Focus end sensor LED control signal. Normally "H" (4.4V).
39	MP		Connected to GND.
40	$\overline{\text{CAM RESET}}$	I	Reset signal input. Normally "H". "L" when reset.
41	VSS		GND
42	XTAL	O	12 MHz clock oscillation circuit
43	EXTAL	I	
44	$\overline{\text{CS CAM}}$	I	Chip select signal from mode control microprocessor.
45	VTR SO	I	Serial data input from mode control microprocessor.
46	VTR SI	O	Serial data output from mode control microprocessor.
47	$\overline{\text{VTR SCK}}$	I	Serial data transfer clock
48	PF7/AN11		Not used.
49	PF6/AN10		
50	PF5/AN9		
51	PF4		Not used.
52	AVSS		GND
53	AVREF		Analog input port reference voltage (5V)
54	AVDD		Analog input port voltage (5V)
55	PF3/AN7		Connected to GND.
56	PF2/AN6		
57	MAN FOCUS (2)	I	Manual focus input. 0 to 5 Vdc.
58	MAN FOCUS (1)	I	Manual focus input. 0 to 5 Vdc.
59	ZOOM SW	I	Zoom key input. 4.3V: F. TELE, 3.1V: TELE, 0.7V: F. WIDE, 1.9V: WIDE, 2.5V: no input.
60	ZOOM POS X4	I	Zoom position voltage. approx. 0V (WIDE end) to approx. 3V (TELE end).
61	HALL A/D	I	Hall voltage. approx. 1V (iris open) to approx. 3V (iris close).
62	ZOOM POSITION A/D	I	Zoom position voltage. approx. 0.2V (WIDE end) to approx. 2.4V (TELE end).
63	PG7/EX11		Connected to 5V.
64	PG6/EX10		
65	PG5/SYNC1		
66	VTR SYNC		
67	PB CTL		
68	DPG		
69	FOC FG		
70	AF BUSY	I	AF busy signal
71	PE7/DAB1		Not used.
72	PE6/DAB0		
73	PE5/DAA1		
74	PE4/DAA0		
75	IRIS PWM	O	Iris control signal. 25.5 μsec period PWM signal
76	ZP PWM	O	Zoom position detection voltage output. 25.5 μsec period PWM signal
77	AJST	I	Adjustment timing pulse input. Normally "H".
78	VD	I	VD signal input from sync generator
79	CAM SI	I	Serial data input
80	CAM SO	O	Serial data output
81	$\overline{\text{CAM SCK}}$	O	Serial data transfer clock
82	$\overline{\text{CS CAM}}$		Not used.
83	PI/TO		
84	PI/PWM		
85	PI/PO		
86	PI O		Connected to +5V.
87	PKO		
88	GND		GND
89	VDD		+5V power supply
90	VPP		
91	PA7/A15		Not used.
92	$\overline{\text{CS PDR}}$	O	Chip select signal to focus predriver (IC706 on CS-35 board)
93	$\overline{\text{CS CAM D/A}}$	O	Chip select signal to camera EVR (IC702 on CS-35 board)
94	$\overline{\text{CS ROM}}$	O	Chip select signal to EEPROM (IC712 on CS-35 board)
95	$\overline{\text{CS OPD}}$	O	Chip select signal to OPD (IC705 on CS-35 board)
96	$\overline{\text{NTSC}}$	O	NTSC: "L", PAL: "H"
97	$\overline{\text{CS CORE}}$	O	Chip select signal to camera core (IC707 on CS-35 board)
98	$\overline{\text{CS TG}}$	O	Select signal to timing generator (IC801 on CS-35 board)
99	J STB		Not used.
100	PB6		

no input.

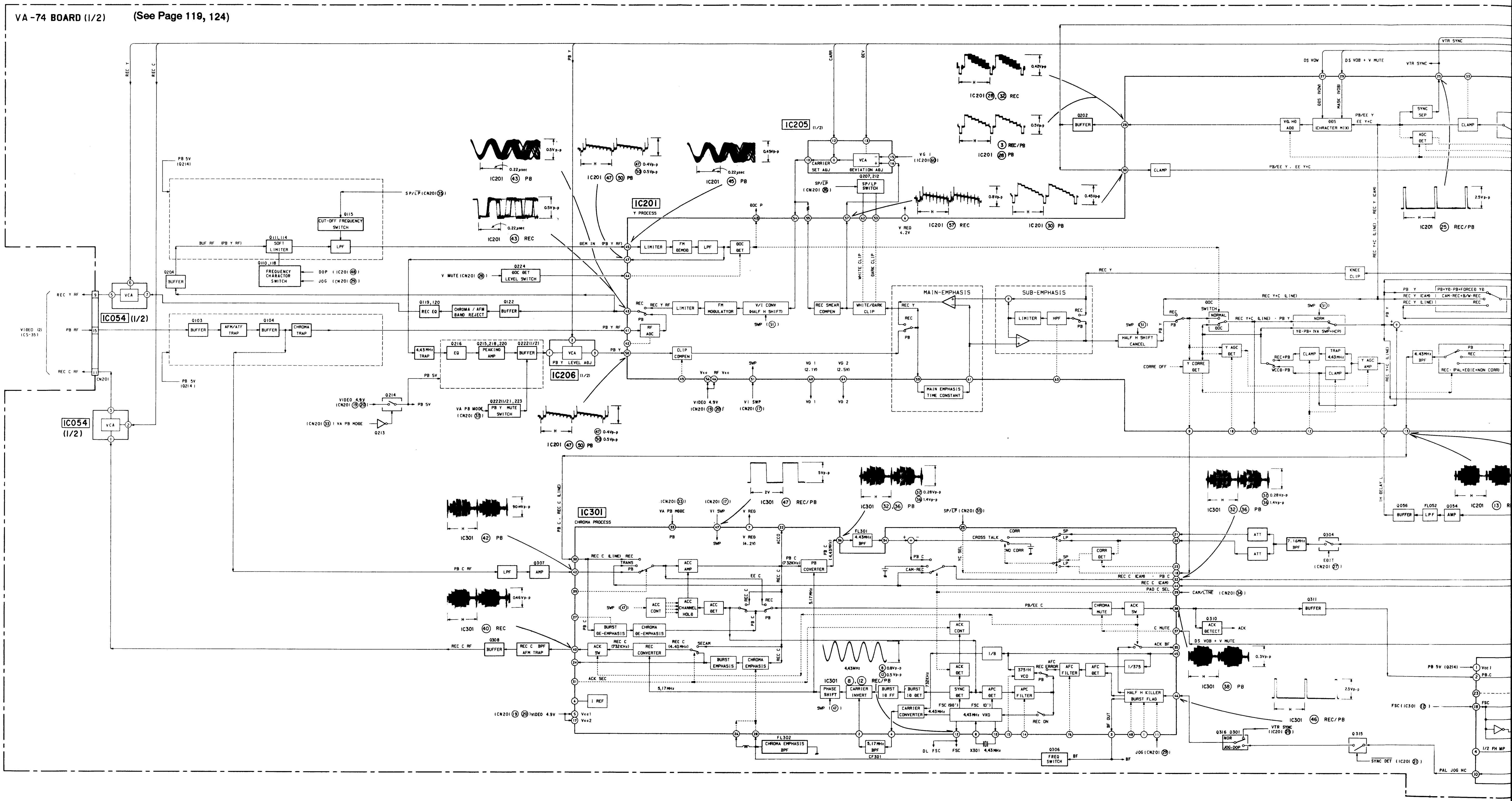
3-5. CAMERA (2) BLOCK DIAGRAM

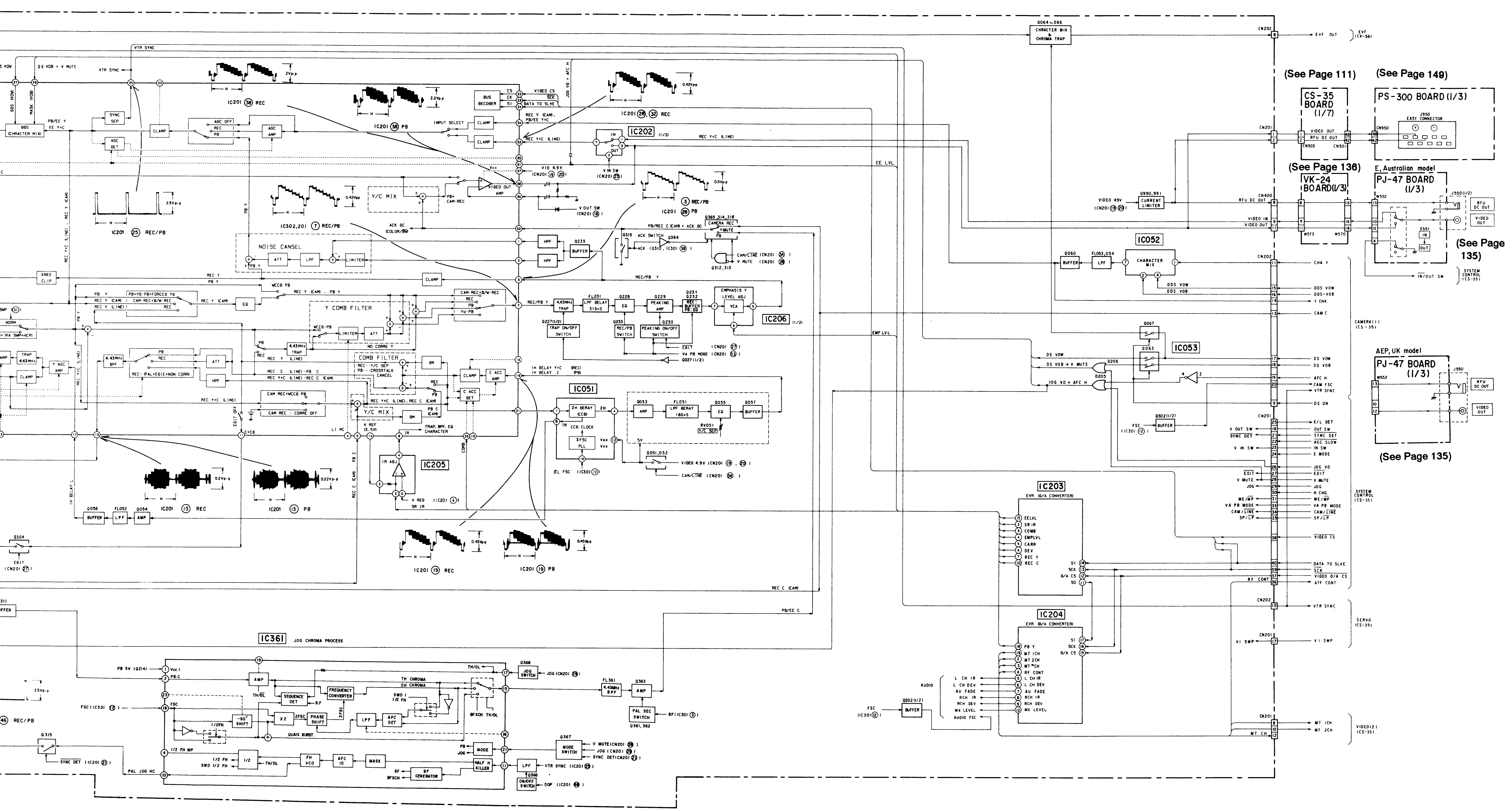
(See Page 105)


CS-35 BOARD (1/7)
(See Page 105)
CAMERA (1)
IRIS PWM (IC709 ⑦⑤)
REF 2V (IC702 ⑫)
HALL OUT (IC709 ⑥①)
HALL OFS (IC702 ⑧)
HALL GAIN (IC702 ⑦)
ZOOM FWD (IC709 ④)
ZOOM REV (IC709 ③)
ZOOM SPD (IC702 ⑥)
AV REF (IC709 ⑤③)
ZOOM POS (IC709 ⑥②)
ZOOM POS X4 (IC702 ⑥⓪)
ZOOM PWM (IC709 ⑦⑥)
TA/CA (IC709 ㉘)
FOC IN 4 (IC706 ⑮)
FOC IN 2 (IC706 ⑬)
FOC IN 3 (IC706 ⑭)
FOC IN 1 (IC706 ⑫)
FOC END FAR (IC709 ㉚)
FOC END LED (IC709 ㊳)
LPF
IC852 (1/4)
IC851 (1/2)
IRIS DRIVE
IC852 (1/4)
HALL BIAS CONTROL
IC851 (1/2)
HALL AMP
IC852 (1/4)
HALL GAIN CONTROL
Q851
IC854
ZOOM MOTOR DRIVE
IN 1
IN 2
OUT 1
OUT 2
Vcc
V CONT
Vss
MT 5V (Q509)
Q853
DRIVE CURRENT LIMITER
IC852 (1/4)
ZOOM REF
IC855 (1/2)
ZOOM POS X4
LPF
IC855 (1/2)
LPF
IC853
FOCUS MOTOR DRIVE
IN 1
IN 2
EN 1
EN 2
A
B
B
A
Vcc
MT 5V (Q509)
CN851
DRIVE (+)
DRIVE (−)
CONT (+)
CONT (−)
BIAS (+)
HALL (+)
HALL (−)
BIAS (−)
ZOOM W
ZOOM T
ZP REF
ZOOM ENC
GND
FOCUS MA
FOCUS MB
FOCUS MB
FOCUS MA
SENS Vcc
SENS
LED
LENS BLOCK
M904
IRIS MOTOR
M
H
M906
ZOOM MOTOR
M
ZOOM POSITION
M905
FOCUS MOTOR
M
FOCUS END SENSOR

(See Page 105)

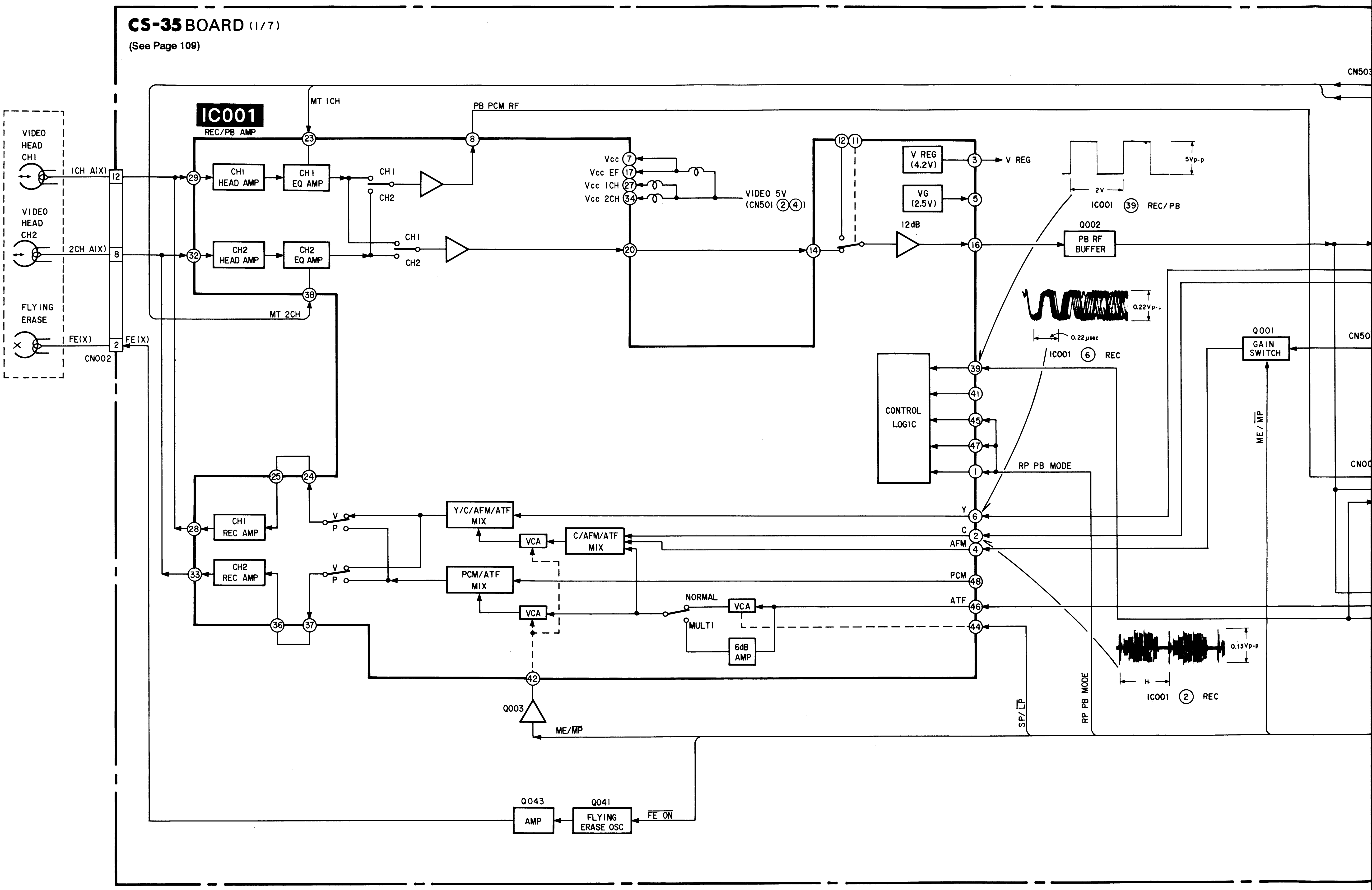
3-6. VIDEO (1) BLOCK DIAGRAM

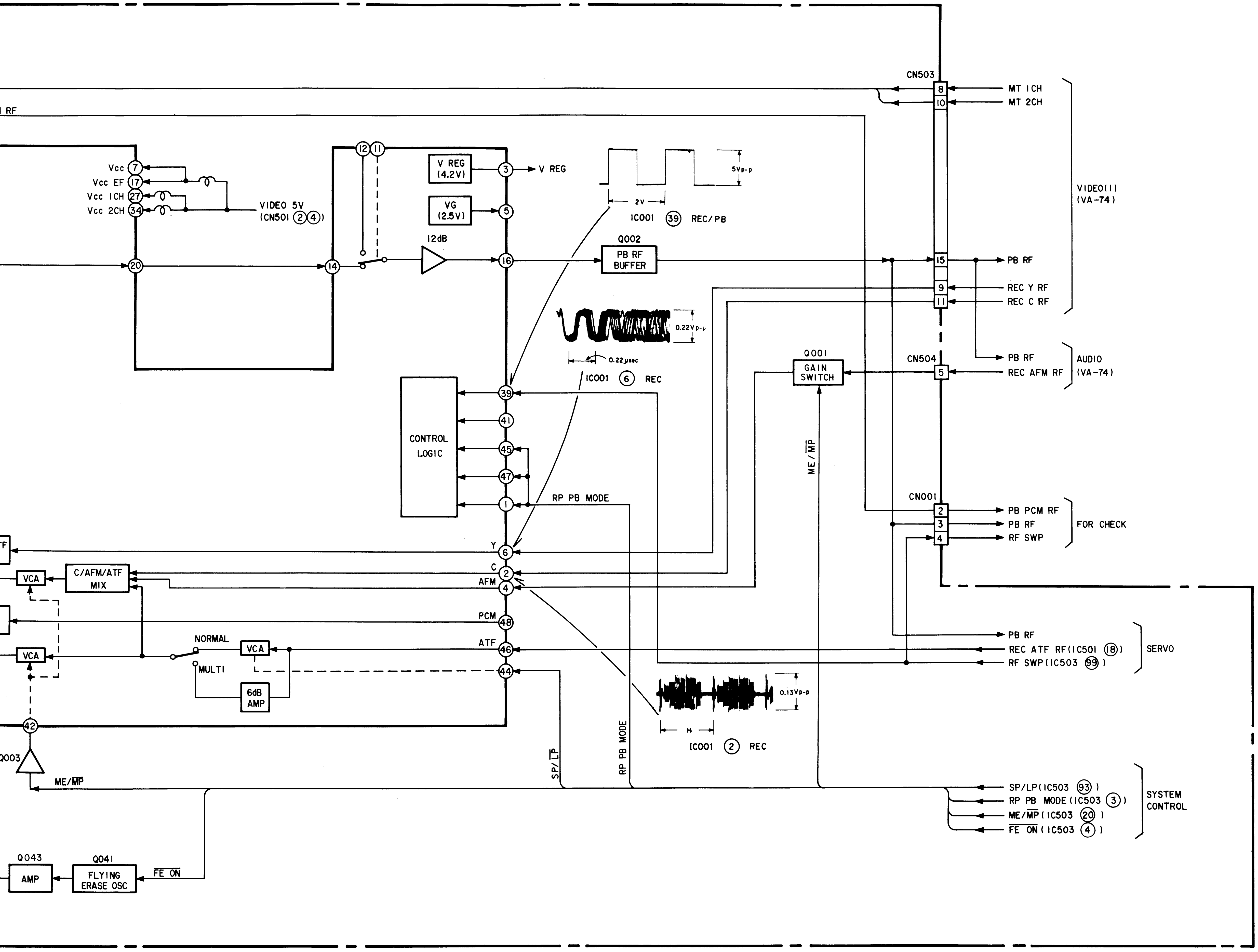

VA-74 BOARD (1/2)
(See Page 119, 124)
REC Y
REC C
PB Y
CARR
DEV
IC205 (1/2)
CARRIER SET ADJ
VCA
DEVIATION ADJ
Q207,212
SP/LP SWITCH
IC201
Y PROCESS
LIMITER
FM DEMOD
LPF
DOC DET
DOC P
Q224
DOC DET LEVEL SWITCH
V MUTE (CN201 ㉘)
Q119,120
REC EQ
CHROMA / AFM BAND REJECT
Q122
BUFFER
LIMITER
FM MODULATOR
V/I CONV (HALF H SHIFT)
REC SMEAR COMPEN
WHITE/DARK CLIP
WHITE CLIP
DARK CLIP
MAIN-EMPHASIS
SUB-EMPHASIS
LIMITER
HPF
MAIN EMPHASIS TIME CONSTANT
HALF H SHIFT CANCEL
Y CORRE DET
CORRE OFF
DOC SWITCH
NORMAL
DOC
Y AGC DET
CLAMP
TRAP 4.43MHz
Y AGC AMP
KNEE CLIP
4.43MHz BPF
REC·(PAL+EDIE+NON CORR)
PB/EE Y · EE Y+C
Q202 BUFFER
CLAMP
VG HD ADD
DDS CHARACTER MIX
SYNC SEP
AGC DET
DS VOW
DS VOB + V MUTE
VTR SYNC
Q115
CUT-OFF FREQUENCY SWITCH
LPF
Q111,114
SOFT LIMITER
Q110,118
FREQUENCY CHARACTOR SWITCH
DOP (IC201 ㊽)
JOG (CN201 ㉙)
SP/LP (CN201 ㉝)
Q204
BUFFER
VCA
IC054 (1/2)
Q103
BUFFER
AFM/ATF TRAP
Q104
BUFFER
CHROMA TRAP
VIDEO (2) (CS-35)
REC Y RF
PB RF
REC C RF
CN201
4.43MHz TRAP
Q216
EQ
Q215,218,220
PEAKING AMP
Q222(1/2)
BUFFER
VCA
PB Y LEVEL ADJ
IC206 (1/2)
RF AGC
CLIP COMPEN
Q214
VIDEO 4.9V (CN201 ⑲ ⑳)
Q213
(CN201 ㉝) VA PB MODE
Q222(1/2),223
PB Y MUTE SWITCH
VA PB MODE (CN201 ㉝)
PB 5V (Q214)
IC201 ㊸ PB
IC201 ㊸ REC
IC201 ㊼ ㊿ PB
IC201 ㊺ PB
IC201 ㉘, ㉜ REC
IC201 ㉖ PB
IC201 ㊺ REC
IC201 ㉚ PB
IC201 ㉕ REC/PB
IC301
CHROMA PROCESS
PB C · REC C (LINE)
Q307
AMP
LPF
PB C RF
REC C (LINE) REC
TRANS PB
ACC AMP
EE C
ACC CONT
ACC CHANNEL HOLD
ACC DET
BURST DE-EMPHASIS
CHROMA DE-EMPHASIS
Q308
BUFFER
REC C BPF AFM TRAP
ACK SW
REC CONVERTER
SECAM
BURST EMPHASIS
CHROMA EMPHASIS
ACK SEC
I REF
(CN201 ⑲ ⑳) VIDEO 4.9V
Vcc1
Vcc2
FL302
CHROMA EMPHASIS BPF
PB C (732KHz)
PB COVERTER
FL301
4.43MHz BPF
CROSS TALK
CORR
NO CORR
CORR DET
CAM-REC
ATT
7.16MHz BPF
Q304
EDIT (CN201 ㉗)
REC C (CAM) · PB C
REC C (CAM)
PAD C SEL
CAM/LINE (CN201 ㉞)
PB/EE C
CHROMA MUTE
ACK SW
Q311
BUFFER
Q310
ACK DETECT
C MUTE
ACK BF
DS VOB + V MUTE
ACK CONT
ACK DET
1/8
SYNC DET
APC DET
3751H VCO
AFC REC ERROR
AFC FILTER
AFC DET
1/375
APC FILTER
HALF H KILLER BURST FLAG
PHASE SHIFT
CARRIER INVERT
BURST 10 FF
BURST 10 DET
CARRIER CONVERTER
4.43MHz VXO
REC ON
5.17MHz BPF
CF301
DL FSC
FSC
X301 4.43MHz
Q306
FREQ SWITCH
BF OUT
JOG (CN201 ㉙)
Q316 D301
NOR
JOG·DOP
VTR SYNC (IC201 ㉕)
Q315
SYNC DET (IC201 ㉑)
PAL JOG HC
PB 5V (Q214)
FSC (IC301 ⑫)
1/2 FH MP
Q056
BUFFER
FL052
LPF
Q054
AMP
IC201 ⑬
1H DELAY L
IC301 ㊷ PB
IC301 ㊵ REC
IC301 ㉜, ㊱ PB
IC301 ㊼ REC/PB
IC301 ⑧, ⑫ REC/PB
IC301 ㊳ PB
IC301 ㊻ REC/PB



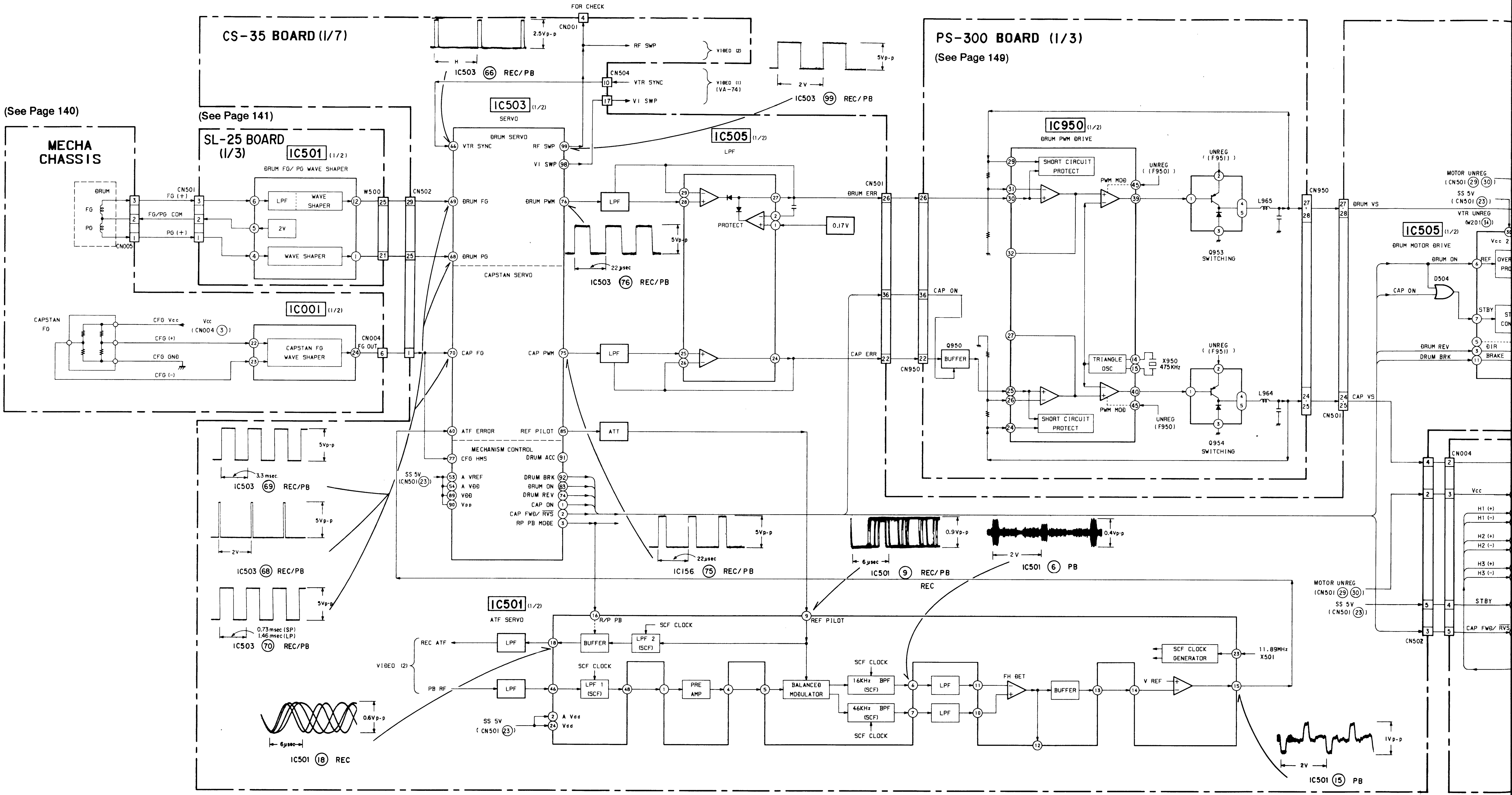
(See Page 111)
CS-35 BOARD (1/7)
(See Page 149)
PS-300 BOARD (1/3)
J950 EASY CONNECTOR
(See Page 136)
VK-24 BOARD(1/3)
E, Australian model
PJ-47 BOARD (1/3)
(See Page 135)
AEP, UK model
PJ-47 BOARD (1/3)
(See Page 135)
IC202
IC206
IC205
IC051
IC052
IC053
IC203
EVR (D/A CONVERTER)
IC204
EVR (D/A CONVERTER)
IC361
JOG CHROMA PROCESS
Q064~066 CHRACTER MIX & CHROMA TRAP
EVF OUT
EVF (CK-56)
NOISE CANSEL
Y COMB FILTER
COMB FILTER
Y/C MIX
BUS DECODER
INPUT SELECT
VIDEO OUT AMP
AGC AMP
CLAMP
HPF
BUFFER
Q235
LIMITER
ATT
LPF
EQ
FL201 LPF DELAY 310×5
PEAKING AMP
EMPHASIS Y LEVEL ADJ
VCA
2H DELAY (CCD)
CCD CLOCK
3FSC PLL
FL051 LPF DELAY 180×5
CHARACTER MIX
CURRENT LIMITER
SEQUENCE DET
FREQUENCY CONVERTER
PHASE SHIFT
APC DET
-90° SHIFT
FH VCO
AFC ID
MASK
MODE
HALF H KILLER
BF GENERATOR
MODE SWITCH
PAL SEC SWITCH
JOG SWITCH
ON/OFF SWITCH
IC201 ㊳ REC
IC201 ㊳ PB
IC201 ㉘, ㉜ REC
IC302,201 ⑦ REC/PB
IC201 ㉕ REC/PB
③ REC/PB
IC201 ㉖ PB
IC201 ⑬ REC
IC201 ⑬ PB
IC201 ⑲ REC
IC201 ⑲ PB
㊻ REC/PB
2Vp-p
2.2Vp-p
0.42Vp-p
2.5Vp-p
0.5Vp-p
0.2Vp-p
0.22Vp-p
0.45Vp-p
CAMERA(1) (CS-35)
SYSTEM CONTROL (CS-35)
SERVO (CS-35)
VIDEO(2) (CS-35)
AUDIO
RFU DC OUT
VIDEO OUT
VIDEO IN
IN/OUT SW
SYSTEM CONTROL (CS-35)

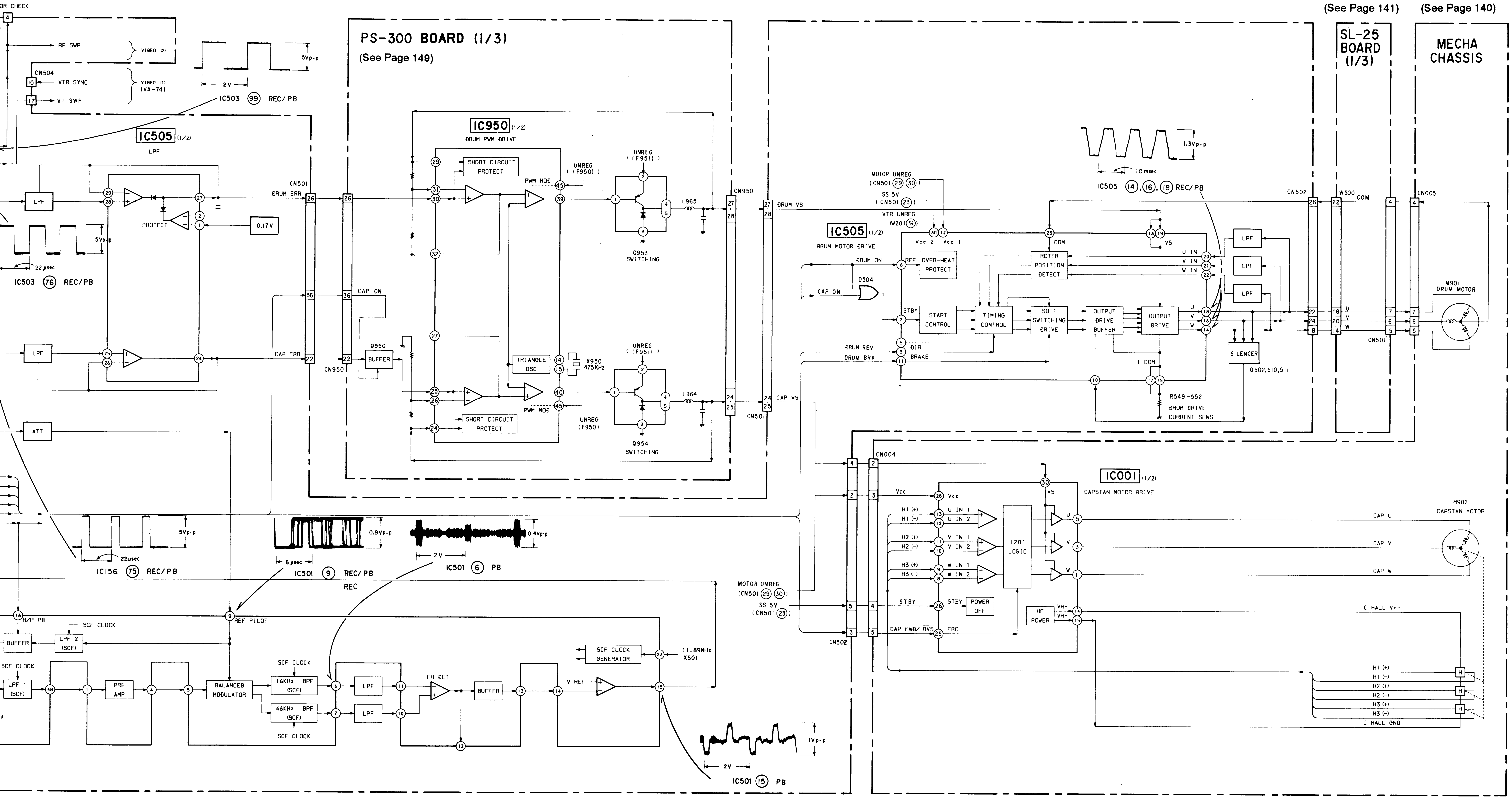
3-7. VIDEO (2) BLOCK DIAGRAM


CS-35 BOARD (1/7)
(See Page 109)
VIDEO HEAD CH1
VIDEO HEAD CH2
FLYING ERASE
1CH A(X)
2CH A(X)
FE(X)
FE(X)
CN002
12
8
2
IC001
REC/PB AMP
MT 1CH
PB PCM RF
MT 2CH
CH1 HEAD AMP
CH1 EQ AMP
CH2 HEAD AMP
CH2 EQ AMP
CH1
CH2
Vcc
Vcc EF
Vcc 1CH
Vcc 2CH
VIDEO 5V
(CN501 ②④)
V REG (4.2V)
VG (2.5V)
V REG
12dB
CN503
Q002
PB RF BUFFER
IC001 ㊴ REC/PB
5Vp-p
2V
0.22Vp-p
0.22μsec
IC001 ⑥ REC
Q001
GAIN SWITCH
CN501
ME/MP
CN00
CONTROL LOGIC
RP PB MODE
CH1 REC AMP
CH2 REC AMP
V
P
Y/C/AFM/ATF MIX
C/AFM/ATF MIX
VCA
PCM/ATF MIX
Y
C
AFM
PCM
ATF
NORMAL
MULTI
6dB AMP
0.13Vp-p
H
IC001 ② REC
Q003
ME/MP
SP/LP
RP PB MODE
Q043
AMP
Q041
FLYING ERASE OSC
FE ON

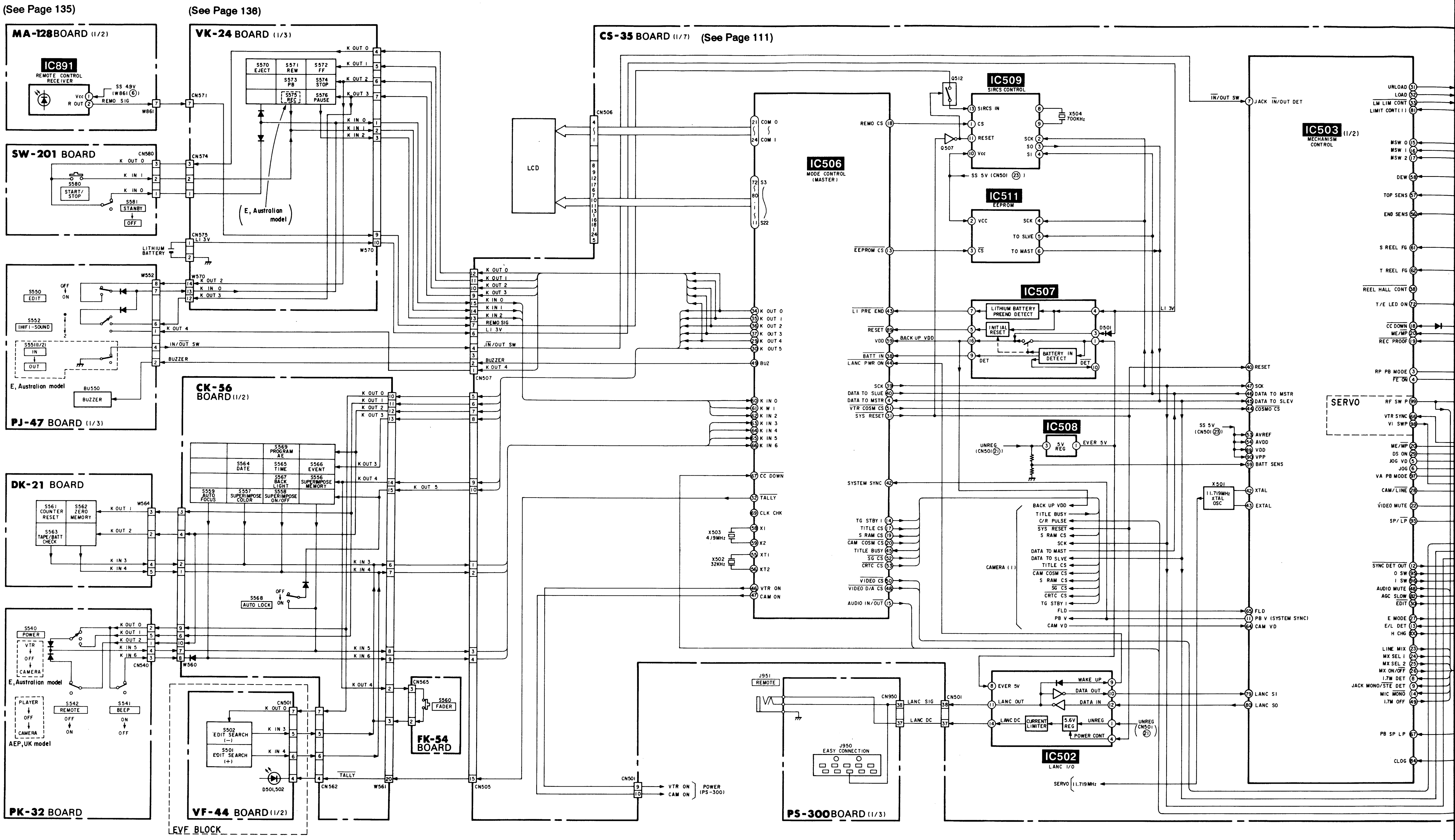

CN503
MT 1CH
MT 2CH
RF
Vcc 7
Vcc EF 17
Vcc 1CH 27
Vcc 2CH 34
VIDEO 5V
(CN501 ② ④)
12
11
V REG
(4.2V)
3
V REG
VG
(2.5V)
5
5Vp-p
2V
IC001 ㊴ REC/PB
12dB
20
14
16
Q002
PB RF
BUFFER
15
PB RF
9
REC Y RF
11
REC C RF
VIDEO(1)
(VA-74)
0.22Vp-p
0.22μsec
IC001 ⑥ REC
Q001
GAIN
SWITCH
CN504
5
PB RF
REC AFM RF
AUDIO
(VA-74)
CONTROL
LOGIC
39
41
45
47
1
RP PB MODE
ME/MP
CN001
2
3
4
PB PCM RF
PB RF
RF SWP
FOR CHECK
Y
6
C
2
AFM
4
C/AFM/ATF
MIX
VCA
PCM
48
ATF
46
44
NORMAL
MULTI
VCA
6dB
AMP
VCA
0.13Vp-p
H
IC001 ② REC
PB RF
REC ATF RF(IC501 ⑱)
RF SWP(IC503 ㊾)
SERVO
42
Q003
ME/MP
SP/LP
RP PB MODE
SP/LP(IC503 ㊸)
RP PB MODE(IC503 ③)
ME/MP(IC503 ⑳)
FE ON(IC503 ④)
SYSTEM
CONTROL
Q043
AMP
Q041
FLYING
ERASE OSC
FE ON

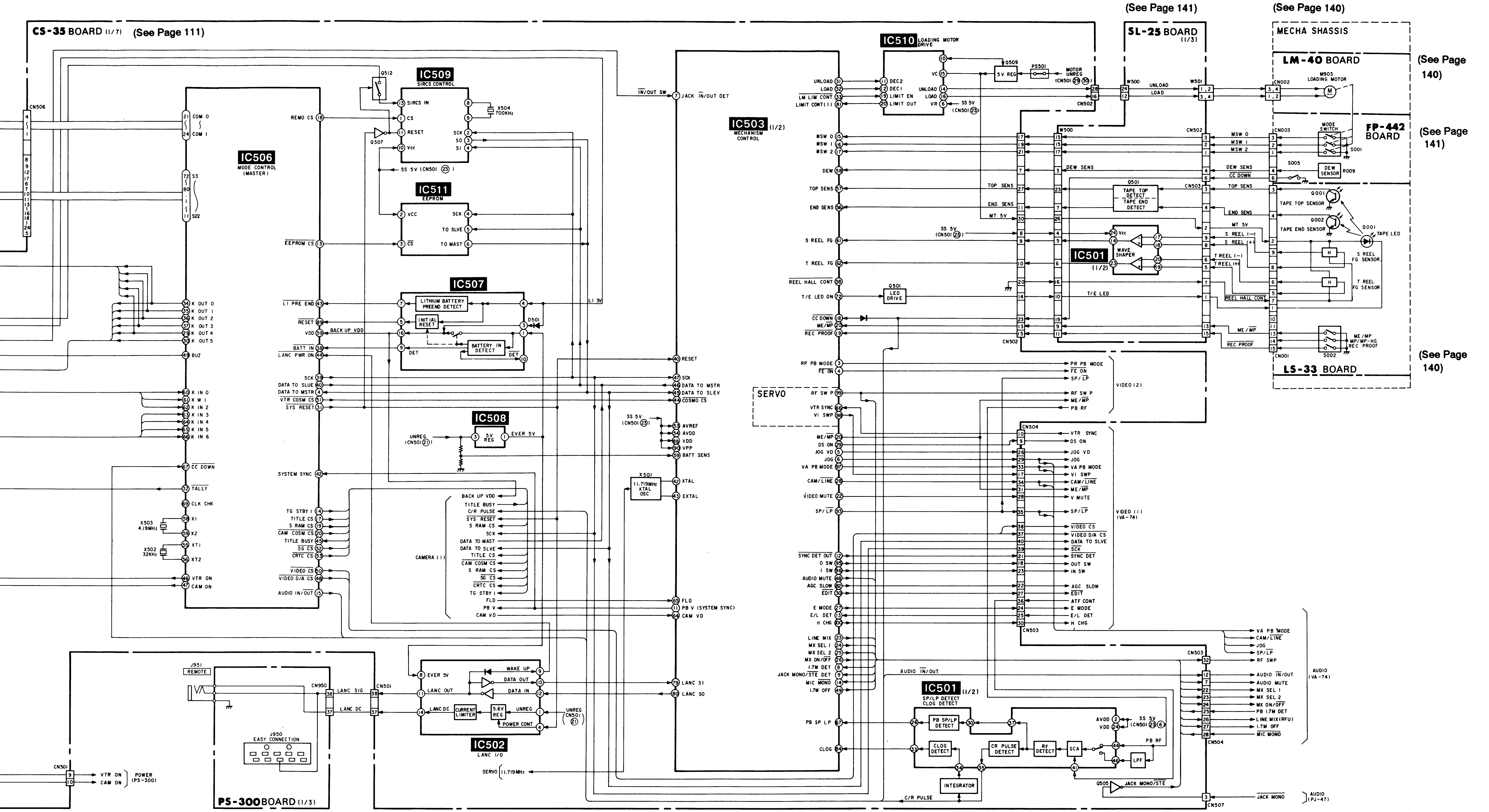
3-8. SERVO BLOCK DIAGRAM


FOR CHECK
CS-35 BOARD (1/7)
CN001
2.5Vp-p
H
IC503 (66) REC/PB
RF SWP
VIDEO (2)
CN504
VTR SYNC
VIDEO (1) (VA-74)
VI SWP
5Vp-p
2V
IC503 (99) REC/PB
PS-300 BOARD (1/3)
(See Page 149)
(See Page 140)
(See Page 141)
MECHA CHASSIS
SL-25 BOARD (1/3)
IC501 (1/2)
DRUM FG/PG WAVE SHAPER
IC503 (1/2)
SERVO
DRUM SERVO
VTR SYNC
RF SWP
VI SWP
IC505 (1/2)
LPF
DRUM
FG
PG
CN501
FG (+)
FG/PG COM
PG (+)
CN005
LPF
WAVE SHAPER
2V
WAVE SHAPER
W500
CN502
DRUM FG
DRUM PWM
DRUM PG
CAPSTAN SERVO
PROTECT
0.17V
5Vp-p
22μsec
IC503 (76) REC/PB
CN501
DRUM ERR
IC950 (1/2)
DRUM PWM DRIVE
SHORT CIRCUIT PROTECT
PWM MOD
UNREG (F950)
UNREG (F951)
L965
Q953 SWITCHING
CN950
DRUM VS
MOTOR UNREG (CN501 (29) (30))
SS 5V (CN501 (23))
VTR UNREG (W201 (34))
IC505 (1/2)
DRUM MOTOR DRIVE
DRUM ON
D504
CAP ON
STBY
REF
OVER PRO
ST CON
DRUM REV
DRUM BRK
DIR
BRAKE
CAPSTAN FG
CFG Vcc
Vcc (CN004 (3))
CFG (+)
CFG GND
CFG (-)
IC001 (1/2)
CAPSTAN FG WAVE SHAPER
CN004
FG OUT
CAP FG
CAP PWM
LPF
CAP ON
Q950
BUFFER
CAP ERR
CN950
TRIANGLE OSC
X950 475KHz
PWM MOD
SHORT CIRCUIT PROTECT
UNREG (F950)
UNREG (F951)
L964
Q954 SWITCHING
CN501
CAP VS
CN004
Vcc
H1 (+)
H1 (-)
H2 (+)
H2 (-)
H3 (+)
H3 (-)
STBY
CAP FWD/RVS
CN502
ATF ERROR
REF PILOT
ATT
MECHANISM CONTROL
CFG HMS
DRUM ACC
SS 5V (CN501 (23))
A VREF
A VDD
VDD
Vpp
DRUM BRK
DRUM ON
DRUM REV
CAP ON
CAP FWD/RVS
RP PB MODE
5Vp-p
3.3msec
IC503 (69) REC/PB
5Vp-p
2V
IC503 (68) REC/PB
5Vp-p
0.73msec (SP) 1.46msec (LP)
IC503 (70) REC/PB
5Vp-p
22μsec
IC156 (75) REC/PB
0.9Vp-p
6μsec
IC501 (9) REC/PB
REC
0.4Vp-p
2V
IC501 (6) PB
IC501 (1/2)
ATF SERVO
R/P PB
SCF CLOCK
REF PILOT
REC ATF
LPF
BUFFER
LPF 2 (SCF)
VIDEO (2)
PB RF
LPF
SCF CLOCK
LPF 1 (SCF)
PRE AMP
BALANCED MODULATOR
SCF CLOCK
16KHz BPF (SCF)
46KHz BPF (SCF)
SCF CLOCK
LPF
LPF
FH DET
BUFFER
V REF
SCF CLOCK GENERATOR
11.89MHz X501
SS 5V (CN501 (23))
A Vdd
Vdd
0.6Vp-p
6μsec
IC501 (18) REC
1Vp-p
2V
IC501 (15) PB


OR CHECK
RF SWP
VIDEO (2)
CN504
VTR SYNC
VI SWP
VIDEO (1) (VA-74)
5Vp-p
2V
IC503 (99) REC/PB
IC505 (1/2)
LPF
PROTECT
0.17V
CN501
DRUM ERR
CAP ON
CAP ERR
5Vp-p
22μsec
IC503 (76) REC/PB
ATT
PS-300 BOARD (1/3)
(See Page 149)
IC950 (1/2)
DRUM PWM DRIVE
SHORT CIRCUIT PROTECT
PWM MOD
UNREG (F950)
UNREG (F951)
Q953 SWITCHING
L965
CN950
Q950
BUFFER
TRIANGLE OSC
X950 475KHz
Q954 SWITCHING
L964
CN501
DRUM VS
CAP VS
MOTOR UNREG (CN501 (29) (30))
SS 5V (CN501 (23))
VTR UNREG (W201 (34))
IC505 (1/2)
DRUM MOTOR DRIVE
Vcc 2
Vcc 1
COM
VS
DRUM ON
REF
OVER-HEAT PROTECT
ROTER POSITION DETECT
U IN
V IN
W IN
D504
STBY
START CONTROL
TIMING CONTROL
SOFT SWITCHING DRIVE
OUTPUT DRIVE BUFFER
OUTPUT DRIVE
U
V
W
DRUM REV
DIR
DRUM BRK
BRAKE
I COM
R549-552
DRUM DRIVE CURRENT SENS
SILENCER
Q502,510,511
LPF
1.3Vp-p
10msec
IC505 (14),(16),(18) REC/PB
(See Page 141)
SL-25 BOARD (1/3)
CN502
W500
COM
(See Page 140)
MECHA CHASSIS
CN005
M901 DRUM MOTOR
CN004
IC001 (1/2)
CAPSTAN MOTOR DRIVE
Vcc
H1 (+)
H1 (-)
U IN 1
U IN 2
H2 (+)
H2 (-)
V IN 1
V IN 2
H3 (+)
H3 (-)
W IN 1
W IN 2
120° LOGIC
MOTOR UNREG (CN501 (29) (30))
SS 5V (CN501 (23))
STBY
POWER OFF
HE POWER
VH+
VH-
CAP FWD/RVS
FRC
CAP U
CAP V
CAP W
M902 CAPSTAN MOTOR
C HALL Vcc
C HALL GND
5Vp-p
22μsec
IC156 (75) REC/PB
0.9Vp-p
6μsec
IC501 (9) REC/PB
REC
0.4Vp-p
2V
IC501 (6) PB
R/P PB
REF PILOT
SCF CLOCK
BUFFER
LPF 2 (SCF)
LPF 1 (SCF)
PRE AMP
BALANCED MODULATOR
16KHz BPF (SCF)
46KHz BPF (SCF)
LPF
FH DET
BUFFER
V REF
SCF CLOCK GENERATOR
11.89MHz X501
1Vp-p
2V
IC501 (15) PB

3-9. SYSTEM CONTROL BLOCK DIAGRAM


(See Page 135)
(See Page 136)
(See Page 111)
MA-128 BOARD (1/2)
IC891
REMOTE CONTROL RECEIVER
VK-24 BOARD (1/3)
S570 EJECT
S571 REW
S572 FF
S573 PB
S574 STOP
S575 REC
S576 PAUSE
(E, Australian model)
SW-201 BOARD
S580 START/STOP
S581 STANBY OFF
LITHIUM BATTERY
PJ-47 BOARD (1/3)
S550 EDIT
S552 (HIFI-SOUND)
S551(1/2) IN OUT
E, Australian model
BU550 BUZZER
CK-56 BOARD (1/2)
S569 PROGRAM AE
S564 DATE
S565 TIME
S566 EVENT
S567 BACK LIGHT
S556 SUPERIMPOSE MEMORY
S559 AUTO FOCUS
S557 SUPERIMPOSE COLOR
S558 SUPERIMPOSE ON/OFF
S568 AUTO LOCK
DK-21 BOARD
S561 COUNTER RESET
S562 ZERO MEMORY
S563 TAPE/BATT CHECK
PK-32 BOARD
S540 POWER
VTR OFF CAMERA
E, Australian model
PLAYER OFF CAMERA
AEP, UK model
S542 REMOTE
S541 BEEP
VF-44 BOARD (1/2)
S502 EDIT SEARCH (−)
S501 EDIT SEARCH (+)
D501,502
EVF BLOCK
FK-54 BOARD
S560 FADER
CS-35 BOARD (1/7)
LCD
IC506 MODE CONTROL (MASTER)
IC509 SIRCS CONTROL
X504 700KHz
Q512
Q507
IC511 EEPROM
IC507
LITHIUM BATTERY PREEND DETECT
INITIAL RESET
BATTERY IN DETECT
D501
IC508 5V REG
UNREG (CN501 ㉑)
EVER 5V
X503 4.19MHz
X502 32KHz
X501 11.719MHz XTAL OSC
CAMERA (1)
IC502 LANC I/O
CURRENT LIMITER
5.6V REG
SERVO (11.719MHz
IC503 (1/2) MECHANISM CONTROL
SERVO
PS-300 BOARD (1/3)
J951 REMOTE
J950 EASY CONNECTION
VTR ON
CAM ON
POWER (PS-300)
K OUT 0
K OUT 1
K OUT 2
K OUT 3
K OUT 4
K OUT 5
K IN 0
K IN 1
K IN 2
K IN 3
K IN 4
K IN 5
K IN 6
REMO SIG
LI 3V
IN/OUT SW
BUZZER
TALLY
REMO CS
EEPROM CS
LI PRE END
RESET
VDD
BACK UP VDD
BATT IN
LANC PWR ON
BUZ
SCK
DATA TO SLVE
DATA TO MSTR
VTR COSM CS
SYS RESET
CC DOWN
CLK CHK
SYSTEM SYNC
TG STBY I
TITLE CS
S RAM CS
CAM COSM CS
TITLE BUSY
SG CS
CRTC CS
VIDEO CS
VIDEO D/A CS
AUDIO IN/OUT
VTR ON
CAM ON
SIRCS IN
CS
RESET
Vcc
SCK
SO
SI
SS 5V (CN501 ㉓)
TO SLVE
TO MAST
LANC SIG
LANC DC
LANC OUT
WAKE UP
DATA OUT
DATA IN
UNREG
POWER CONT
LANC SI
LANC SO
JACK IN/OUT DET
AVREF
AVDD
VPP
BATT SENS
XTAL
EXTAL
FLD
PB V (SYSTEM SYNC)
CAM VD
UNLOAD
LOAD
LM LIM CONT
LIMIT CONT(1)
MSW 0
MSW 1
MSW 2
DEW
TOP SENS
END SENS
S REEL FG
T REEL FG
REEL HALL CONT
T/E LED ON
CC DOWN
ME/MP
REC PROOF
RP PB MODE
FE ON
RF SW P
VTR SYNC
VI SWP
ME/MP
DS ON
JOG VD
JOG
VA PB MODE
CAM/LINE
VIDEO MUTE
SP/LP
SYNC DET OUT
O SW
I SW
AUDIO MUTE
AGC SLOW
EDIT
E MODE
E/L DET
H CHG
LINE MIX
MX SEL 1
MX SEL 2
MX ON/OFF
1.7M DET
JACK MONO/STE DET
MIC MONO
1.7M OFF
PB SP LP
CLOG
CN571
CN574
CN575
CN580
CN505
CN506
CN507
CN501
CN540
CN562
CN565
CN950
W552
W561
W564
W570
W560
W861


CS-35 BOARD (1/7) (See Page 111)
(See Page 141)
SL-25 BOARD (1/3)
(See Page 140)
MECHA SHASSIS
LM-40 BOARD
(See Page 140)
FP-442 BOARD
(See Page 141)
LS-33 BOARD
(See Page 140)
IC506 MODE CONTROL (MASTER)
IC509 SIRCS CONTROL
IC511 EEPROM
IC507
IC508
IC510 LOADING MOTOR DRIVE
IC503 (1/2) MECHANISM CONTROL
IC501 (1/2) WAVE SHAPER
IC501 (1/2) SP/LP DETECT CLOG DETECT
IC502 LANC I/O
SERVO
M903 LOADING MOTOR
MODE SWITCH
S001
S005
DEW SENSOR
R009
Q001 TAPE TOP SENSOR
Q002 TAPE END SENSOR
D001 TAPE LED
S REEL FG SENSOR
T REEL FG SENSOR
S002
X501 11.719MHz XTAL OSC
X503 4.19MHz
X502 32KHz
X504 700KHz
J951 REMOTE
J950 EASY CONNECTION
PS-300 BOARD (1/3)
LITHIUM BATTERY PREEND DETECT
INITIAL RESET
BATTERY IN DETECT
5V REG
CURRENT LIMITER
5.6V REG
TAPE TOP DETECT
TAPE END DETECT
LED DRIVE
PB SP/LP DETECT
CLOG DETECT
CR PULSE DETECT
RF DETECT
GCA
LPF
INTEGRATOR
JACK MONO/STE
VIDEO (2)
VIDEO (1) (VA-74)
CAMERA (1)
AUDIO (VA-74)
AUDIO (PJ-47)
POWER (PS-300)
SERVO 11.719MHz
CN501
CN502
CN503
CN504
CN506
CN507
CN950
W500
W501
CN001
CN002
CN003

3-10. MECHANISM CONTROL MICROPROCESSOR PIN FUNCTION (IC503 ON CS-35 BOARD: CXP80624)

Pin No.	Port Name	Signal	I/O	Connection	Function
1	11	CAP ON	O	MD	Capstan driver ON/OFF control signal. "H" when capstan ON.
2	PB4/PP012	CAP FWD/$\overline{\text{RVS}}$	O	MD	Capstan rotating direction control signal. "H": FWD, "L": RVS.
3	PB3/PP011	RP PB MODE	O	RP	REC/PB select signal of REC/PB amplifier (IC001 on CS-35 board) and ATF servo IC (IC501 on CS-35 board). "H": PB.
4	PB2/PP010	$\overline{\text{FE ON}}$	O	RP	Flying erase oscillation ON/OFF control signal. "L": oscillation.
5	PB1/PP09	JOG VD	O	VA	False VD signal to be inserted into playback video signal during variable speed playback.
6	PB0/PP08	JOG	O	VA	Variable speed/normal speed playback select signal of video circuit. "H" when variable speed playback.
7	PC7/RT07	JACK $\overline{\text{IN}}$/OUT DET	I	VA	Jack in/out switch input. "L" when input.
8	PC6/RT06	1.7M DET	I	VA	Normal/stereo discrimination input. "H" when AFM stereo tape playback.
9	PC5/RT05	JACK MONO/$\overline{\text{STE}}$ DET	I	VA	AUDIO IN/OUT jack monaural/stereo discrimination input. "H": monaural (No jack inserted in right terminal)
10	PC4/RT04	INT VD	I		Not used.
11	PC3/RT03	PB V (SYSTEM SYNC)	O	MODE CON	V sync for mode controller.
12	PC2/RT018	$\overline{\text{SYNC DET OUT}}$	O	VA	Sync detect output. "L" when Sync is detected.
13	PC1/RT017	E/$\overline{\text{L}}$ DET	I	VA	Not used.
14	PC0/RT016	MIC $\overline{\text{MONO}}$	I	AU	External microphone monaural/stereo discrimination input. "L" when monaural microphone used.
15	PJ7	M SW 0	I	MD	Mode switch input.
16	PJ6	M SW 1	I	MD	
17	PJ5	M SW 2	I	MD	
18	PJ4	$\overline{\text{CC DOWN}}$	I	MD	Cassette compartment down switch input. "L": down.
19	PJ3	$\overline{\text{REC PROOF}}$	I	MD	Erasure protection switch input. "L" when REC prohibit.
20	PJ2	ME/$\overline{\text{MP}}$	I	MD	ME/MP switch input. "L": MP, "H": ME.
21	PJ1	HG/$\overline{\text{NOR}}$	I	MD	Connected to GND.
22	PJ0	VIDEO MUTE	O	VA	Video output mute signal. "H": mute.
23	PD7	LINE MIX	I	VA	AUDIO OUT monaural/stereo select signal. "H": monaural.
24	PD6	MX SEL 1	I	VA	Matrix select signal.
25	PD5	MX SEL 2	I	VA	
26	PD4	MX ON/$\overline{\text{OFF}}$	O	VA	Matrix ON/OFF signal. "H" when matrix on (stereo).
27	PD3	E MODE	O	VA	Not used.
28	PD2	CAM/$\overline{\text{LINE}}$	O	VA	Camera input/line input select signal. "H" when camera input.
29	PD1	DS ON	O	VA	Data screen ON/OFF signal. "H": ON.
30	PD0	$\overline{\text{EDIT}}$	O	VA	Video circuit EDIT/NORMAL switch signal. "L": EDIT.
31	PH7	UNLOAD	O	SS	Loading motor control signal. "H" or "H" pulse when unloading.
32	PH6	LOAD	O	SS	Loading motor control signal. "H" or "H" pulse when loading.
33	PH5	$\overline{\text{LM LIM COM}}$	O	SS	Loading motor limiter control signal. Temporary "H" when loading.
34	PH4	COMP REC	O	VA	Not used.
35	PH3	DRUM REV	O	SS	Drum rotating control signal . Normally "L".
36	PH2		O		N.C.
37	PH1		O		
38	PH0	$\overline{\text{REEL HALL CONT}}$	O	SS	Not used.
39	MP	MP			Connected to GND.
40	RST	$\overline{\text{RESET}}$	I	MODE CON	Reset signal from mode control microprocessor. "L" when reset.
41	VSS	VSS			GND
42	XTAL	XTAL	I	SS	11.89 MHz clock oscillation circuit.
43	EXTAL	EXTAL	O	SS	

Mode switch input.

	BL	END	EJECT	USE	LOAD	READY	TURN	REC/PB	FF
M SW 0	L	L	L	H	L	H	H	L	L
M SW 1	L	H	L	L	L	L	H	H	L
M SW 2	L	H	H	H	H	L	L	L	L

Matrix select signal.

	STEREO	MAIN	SUB
MX SEL 1	L	L	H
MX SEL 2	L	H	L

Pin No.	Port Name	Signal	I/O	Connection	Function
44	CSO	$\overline{\text{COSMO CS}}$	I	MODE CON	Chip select signal from mode control microprocessor (CS-35 board IC506)
45	S10	DATA TO SLVE	I	MODE CON	Serial data input from mode control microprocessor.
46	S00	DATA TO MSTR	O	MODE CON	Serial data output to mode control microprocessor.
47	SCKO	SCK	I	MODE CON	Serial clock input from mode control microprocessor.
48	PF7/AN11	AUDIO MUTE	O	VA	Audio output mute signal. "H": mute.
49	PF6/AN10	1.7M OFF	O	VA	1.7 MHz REC AFM carrier ON/OFF signal. "H": OFF (monaural recording).
50	PF5/AN9	GND	I		GND
51	PF4/AN8	GND	I		
52	AVSS	AVSS			Analog port GND.
53	AVREF	AVREF			Analog port reference voltage. Connected to +5V.
54	AVDD	VDD			Analog port power supply (5V).
55	PF3/AN7	N.C.			Connected to GND.
56	PF2/AN6	END SENS	I	SS	Tape end detection signal. Normally "L", "H" pulse: tape end.
57	PF1/AN5	TOP SENS	I	SS	Tape top detection signal. Normally "L", "H" pulse: tape top.
58	PF0/AN4	DEW	I	SS	Dew condensation detection signal. "L" when dew condensation.
59	AN3	BATT SENSE	I	SS	Battery voltage input for battery end detection. 1/2 divided by RB504.
60	AN2	ATF ERROR	I	SS	ATF error, ATF lock error input.
61	AN1	S REEL FG	I	SS	S reel FG signal input.
62	AN0	T REEL FG	I	SS	T reel FG signal input.
63	PG7/EXI1	PG7 (N.C.)			Connected to GND.
64	PG6/EXI0	CAM VD	I	CAM SG	VD signal from camera circuit sync generator. V period pulse.
65	PG5/SYNC1	FLD	I	CAM SG	FIELD signal from camera circuit sync generator. 2V period pulse.
66	PG4/SYNC0	VTR SYNC	I	VA	Composite sync signal separated from REC/PB Y signal.
67	PG3/PBCTL	PB SP LP	I	SS	Discriminates PB tape REC mode when CUE/REVIEW/FF and REW. "L": LP.
68	PG2/DPG	DRUM PG	I	SS	Drum PG signal input. For drum phase servo 40 msec period "H" pulse.
69	PG1/DFG	DRUM FG	I	SS	Drum FG signal input. For drum speed servo 3.3 msec period pulse.
70	PG0/CFG	CAP FG	I	MD	Capstan FG signal input. For capstan speed servo. Approx. 1388 Hz when REC/PB (SP).
71	PE7/DAB0	N.C.	O		N.C.
72	PE6/DAB0	T/E LED ON	O	SS	Tape LED ON/OFF signal. 100 msec period "H" pulse when REC/PB.
73	PE5/DAA1	N.C.	O		N.C.
74	PE4/DAA0	N.C.	O		
75	PE3/PWM1	CAP PWM	O	SS	Capstan error signal output 20.15 μsec PWM signal.
76	PE2/PWM0	DRUM PWM	O	SS	Drum error signal output 20.15 μsec PWM signal.
77	PE1/EC/INT2	C FG	I	MD	Capstan FG signal input. For tape counter.
78	PE0/INT0	$\overline{\text{S JACK IN}}$			Not used, connected to +5V.
79	P17/ST1	LANC IN	I	SS	Control L serial data input.
80	P16/SO1	LANC OUT	O	SS	Control L serial data output.
81	P15/SCK1	LIMIT CONT (1)	I	SS	Loading motor limiter ON detection signal. Normally "H", "L" when limiter ON.
82	P14/INT1	AGC SLOW			Not used.
83	P13/TO	DRUM ON	O	SS	Drum driver ON/OFF control signal. "H" when drum ON.
84	P12/PWM	CLOG	O	SS	Head clog detection signal. "L" when no trouble.
85	P11/PO	REF PILOT	O	SS	ATF servo reference pilot signal. Synchronized when drum rotation to output by selecting four frequencies. f1=101.0kHz, f2=117.2 kHz, f3=162.8 kHz and f4=146.5kHz.

Pin No.	Po
86	P10
87	PK
88	VS
89	VD
90	N.C
91	PA
92	PA
93	PA
94	PA
95	PA
96	PA
97	PA
98	PA
99	PB
100	0

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Pin No.	Port Name	Signal	I/O	Connection	Function
44	CSO	$\overline{\text{COSMO CS}}$	I	MODE CON	Chip select signal from mode control microprocessor (CS-35 board IC506)
45	S10	DATA TO SLVE	I	MODE CON	Serial data input from mode control microprocessor.
46	S00	DATA TO MSTR	O	MODE CON	Serial data output to mode control microprocessor.
47	SCKO	SCK	I	MODE CON	Serial clock input from mode control microprocessor.
48	PF7/AN11	AUDIO MUTE	O	VA	Audio output mute signal. "H": mute.
49	PF6/AN10	1.7M OFF	O	VA	1.7 MHz REC AFM carrier ON/OFF signal. "H": OFF (monaural recording).
50	PF5/AN9	GND	I		GND
51	PF4/AN8	GND	I		
52	AVSS	AVSS			Analog port GND.
53	AVREF	AVREF			Analog port reference voltage. Connected to +5V.
54	AVDD	VDD			Analog port power supply (5V).
55	PF3/AN7	N.C.			Connected to GND.
56	PF2/AN6	END SENS	I	SS	Tape end detection signal. Normally "L", "H" pulse: tape end.
57	PF1/AN5	TOP SENS	I	SS	Tape top detection signal. Normally "L", "H" pulse: tape top.
58	PF0/AN4	DEW	I	SS	Dew condensation detection signal. "L" when dew condensation.
59	AN3	BATT SENSE	I	SS	Battery voltage input for battery end detection. 1/2 divided by RB504.
60	AN2	ATF ERROR	I	SS	ATF error, ATF lock error input.
61	AN1	S REEL FG	I	SS	S reel FG signal input.
62	AN0	T REEL FG	I	SS	T reel FG signal input.
63	PG7/EXI1	PG7 (N.C.)			Connected to GND.
64	PG6/EXI0	CAM VD	I	CAM SG	VD signal from camera circuit sync generator. V period pulse.
65	PG5/SYNC1	FLD	I	CAM SG	FIELD signal from camera circuit sync generator. 2V period pulse.
66	PG4/SYNC0	VTR SYNC	I	VA	Composite sync signal separated from REC/PB Y signal.
67	PG3/PBCTL	PB SP LP	I	SS	Discriminates PB tape REC mode when CUE/REVIEW/FF and REW. "L": LP.
68	PG2/DPG	DRUM PG	I	SS	Drum PG signal input. For drum phase servo 40 msec period "H" pulse.
69	PG1/DFG	DRUM FG	I	SS	Drum FG signal input. For drum speed servo 3.3 msec period pulse.
70	PG0/CFG	CAP FG	I	MD	Capstan FG signal input. For capstan speed servo. Approx. 1388 Hz when REC/PB (SP).
71	PE7/DAB0	N.C.	O		N.C.
72	PE6/DAB0	T/E LED ON	O	SS	Tape LED ON/OFF signal. 100 msec period "H" pulse when REC/PB.
73	PE5/DAA1	N.C.	O		N.C.
74	PE4/DAA0	N.C.	O		
75	PE3/PWM1	CAP PWM	O	SS	Capstan error signal output 20.15 μsec PWM signal.
76	PE2/PWM0	DRUM PWM	O	SS	Drum error signal output 20.15 μsec PWM signal.
77	PE1/EC/INT2	C FG	I	MD	Capstan FG signal input. For tape counter.
78	PE0/INT0	$\overline{\text{S JACK IN}}$			Not used, connected to +5V.
79	P17/ST1	LANC IN	I	SS	Control L serial data input.
80	P16/SO1	LANC OUT	O	SS	Control L serial data output.
81	P15/SCK1	LIMIT CONT (1)	I	SS	Loading motor limiter ON detection signal. Normally "H", "L" when limiter ON.
82	P14/INT1	AGC SLOW			Not used.
83	P13/TO	DRUM ON	O	SS	Drum driver ON/OFF control signal. "H" when drum ON.
84	P12/PWM	CLOG	O	SS	Head clog detection signal. "L" when no trouble.
85	P11/PO	REF PILOT	O	SS	ATF servo reference pilot signal. Synchronized when drum rotation to output by selecting four frequencies. f1=101.0kHz, f2=117.2 kHz, f3=162.8 kHz and f4=146.5kHz.

Pin No.	Port Name	Signal	I/O	Connection	Function
86	P10/PO				Connected to +5V.
87	PKO	13/10 SW	I	MD	Connected to GND.
88	VSS	VSS			GND
89	VDD	VDD			VDD
90	N.C.	(VPP)			Connected to +5V.
91	PA7/PP07	DRUM ACC	O	SS	Drum motor acceleration signal. Normally "L". "H" pulse when SLOW mode. (Not used.)
92	PA6/PP06	DRUM BRK	O	SS	Drum motor brake signal. Normally "L".
93	PA5/PP05	SP/$\overline{\text{LP}}$	O	VA	SP/LP select signal. "L": LP.
94	PA4/PP04	AU IN/OUT	O		N.C.
95	PA3/PP03	O SW	O	VA	VIDEO OUT inhibit signal. "H": inhibit.
96	PA2/PP02	I SW	O	VA	VIDEO IN/OUT select signal. "L": VIDEO IN.
97	PA1/PP01	VA PB MODE	O	ALL	Video/audio circuit REC/PB select signal. "H": PB.
98	PA0/PP00	VI SWP	O	VA	RF switching pulse signal for video circuit. 25 Hz, 50% duty pulse.
99	PB7/PP015	RF SWP	O	ALL	RF switching pulse signal for REC/PB amp and Audio circuit. 25Hz, 50% duty pulse.
100	0	H CHG	O	VA	Not used.

3-11. MODE CONTROL MICROPROCESSOR PIN FUNCTION (IC506 ON CS-35 BOARD: μPD75316)

Pin No.	Port Name	Signal	I/O	Connection	Function
1	S12	S12	O		Segment terminal drive signal to LCD. (Four value output of 0, 1.7, 3.3, 5V)
2	S13	S13	O		
3	S14	S14	O		
4	S15	S15	O		
5	S16	S16	O		
6	S17	S17	O		
7	S18	S18	O		
8	S19	S19	O		
9	S20	S20	O		
10	S21	S21	O		
11	S22	S22	O		
12	S23	S23	O		Not used.
13	S24/BP0	$\overline{\text{EEPROM CS}}$	O		Chip select signal to EEPROM (IC511 on CS-35 board). 1/2V period "L" pulse.
14	S25/BP1	TG STBY 1	O	CAM	Power save control signal to timing generator (IC801 on CS-35 board). Normally "L".
15	S26/BP2	AUDIO IN/$\overline{\text{OUT}}$	O	AU	Audio input/output control signal. "H": input. "L": output.
16	S27/BP3		O		N.C.
17	S28/BP4	TITLE CS	O	CAM	Chip select signal to DISPLAY CONTROLLER (IC711 on CS-35 board).
18	S29/BP5	REMO CS	O		Chip select signal to sircs remote controller (IC509 on CS-35 board). 1V period "L" pulse.
19	S30/BP6	S RAM CS	O		Chip select signal to S RAM (IC710 on CS-35 board). "H" when using title. Normally, "L".
20	S31/BP7	$\overline{\text{CAM COSM CS}}$	O	CAM	Chip select signal to camera controller (IC709 on CS-35 board). 1V period "L" pulse.
21	COM0	COM 0	O		Common terminal drive signal to LCD. (Four value output of 0, 1.7, 3.3, 5V)
22	COM1	COM 1	O		
23	COM2	COM 2	O		
24	COM3	COM 3	O		
25	BIAS	BIAS	O		Bias voltage output for voltage deviding resistor.
26	VLC0	VCC 0	I		Power source 0 input
27	VLC1	VCC 1	I		Power source 1 input Power source for LCD drive.
28	VLC2	VCC 2	I		Power source 2 input
29	P40	K OUT 4	O	all	KEY matrix output. 1V period "L" pulse output when corresponding key is pressed. "L" when other cases.
30	P41	K OUT 5	O	all	
31	P42	$\overline{\text{SYS RESET}}$	O	all	Output signal to reset each IC when power is turned on. Normally "H".
32	P43	$\overline{\text{TALLY}}$	O	EVF	Tally LED ON/OFF signal. "L": ON.
33	VSS	VSS			GND
34	P50	K OUT 0	O	all	KEY matrix output. 1V period "L" pulse output when corresponding key is pressed. "L" when other cases.
35	P51	K OUT 1	O	all	
36	P52	K OUT 2	O	all	
37	P53	K OUT 3	O	all	
38	P00/INT4	$\overline{\text{BATT IN}}$	I		Clock select to 32 kHz when "L" and to 4.19 MHz with "H" when Battery is turned on. "L" is select.
39	P01/$\overline{\text{SCK}}$	SCK	O	all	Serial clock output terminal, Serial clock (2 μS) communication.
40	P02/SO/SB0	DATA TO SLVE	O	all	Serial bus output terminal, Serial clock (2 μS) communication.
41	P03/SI/SB1	DATA TO MSTR	I	all	Serial bus input terminal, Serial clock (2 μS) communication.
42	P10/INT0	SYSTEM SYNC	I	all	(Edge detection vector interruption), System synchronization input port from CXP80624 (IC503 on CS-35 board).
43	P11/INT1	$\overline{\text{LI PRE END}}$	I		(Edge detection vector interruption), Lithium PRE END is selected with "L".
44	P12/INT2	$\overline{\text{LANC PWR ON}}$	I		Power on signal input from wired remote control. "L" when power switch pressed.
45	P13/TIO	TITLE BUSY	I	CAM	Busy signal from DISPLAY CONTROLLER (IC711 on CS-35 board).
46	P20/PT00	VTR ON	O	PS	VTR power source (SS5V, VIDEO 5V, AUDIO 5V, EVF 5V, D5V, D4V) control signal. "H" when power switch is in "VTR" or "CAMERA" position.
47	P21	CAM ON	O	PS	CAMERA power source (CAM 5V, +15V, –9V) control signal. "H" when power switch is in "CAMERA" position.
48	P22/PCL	$\overline{\text{VIDEO D/A CS}}$	O	VA	Serial data load signal to video circuit EVR (IC203, 204 on VA-74 board). 1V period "H" pulse.
49	P23/BUZ	BUZ	O		Buzzer output. Normally "L". 2 kHz pulse: alarm.
50	P30/LCDCL	$\overline{\text{VIDEO CS}}$	O	VA	Chip select signal to Y process IC (IC201 on VA-74 board). 1V period "L" pulse.
51	P31/SYNC	$\overline{\text{VTR COSM CS}}$	O		Chip select signal to mechanism controller (IC503 on CS-35 board). 1V period "L" pulse.
52	P32	$\overline{\text{SG CS}}$	O	CAM	Chip select signal to sync generator (IC704 on CS-35 board). 1V period "L" pulse.
53	P33	$\overline{\text{CRTC CS}}$	O	CAM	Strobe signal for character generator (IC703 on CS-35 board). 1V period "H" pulse.
54	VDD	VDD			VDD
55	XT1	XT1	I		SUB system clock. 32 kHz oscillation terminal.
56	XT2	XT2			
57	N.C.	N.C.			Connected to +5V.
58	X1	X1	I		Main system clock. 4.19 MHz oscillation terminal.
59	X2	X2	I		
60	P60/KK0	K IN 0	I	all	KEY matrix input. 1V period "L" pulse input when corresponding key is pressed. "H" when other case.
61	P61/KR1	K IN 1	I	all	
62	P62/KR2	K IN 2	I	all	
63	P63/KR3	K IN 3	I	all	
64	P70/KR4	K IN 4	I	all	
65	P71/KP5	K IN 5	I	all	
66	P72/KP6	K IN 6	I	all	
67	P73/KP7	$\overline{\text{CC DOWN}}$	I	MD	Cassette compartment lock switch input. "L": Lock.
68	$\overline{\text{RESET}}$	$\overline{\text{RESET}}$	I		System reset input. "L": Reset, Normally: "H".
69	S0	CLK CHK	O		Clock (32 kHz) output terminal for check.
70	S1	S1	O		Not used.
71	S2	S2	O		
72	S3	S3	O		Segment terminal drive signal to LCD. (Four value output of 0, 1.7, 3.3, 5V)
73	S4	S4	O		
74	S5	S5	O		
75	S6	S6	O		
76	S7	S7	O		
77	S8	S8	O		
78	S9	S9	O		
79	S10	S10	O		
80	S11	S11	O		

3-12. INTERFACE

3-12-1. System Control – Video/Audio Block Interface (CS-35 BOARD)

NAME	I/O	No.	VTR MODE																CAMERA MODE					
			STOP	FF	REW	FR SEARCH		PB	PICTURE SEARCH		PB· PAUSE	FRAME	SLOW	X2	SHUTTLE EDIT *3		REC *4	REC *4 PAUSE	STAND BY	REC	EDIT SEARCH		REC REVIEW	
						CUE	REVIEW		CUE	REVIEW					FWD	REV					FWD	RVS	FWD	RVS
SP/LP	O	IC503 (93)	*1	H	H	*2	*2	*2	*2	*2	*1	*1	*1	*1	*2	*2	*6	H/L	H/L	*6	*2	*2	*2	*2
VA PB MODE	O	IC503 (97)	L	L	L	H	H	H	H	H	H	H	H	H	H	H	L	L	L	L	H	H	H	H
AUDIO MUTE *13	O	IC503 ㊽	L	L	L	H	H	L	H	H	H	H	H	L	H	H	L	L	L	L	H	H	H	H
VIDEO MUTE	O	IC503 ㉒	*14	*14	*14	*15	*15	*15	*15	*15	*15	*15	*15	*15	*15	*15	*14	*14	L	L	*15	*15	*15	*15
CAM/LINE	O	IC503 ㉘	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	H	H	L	L	L	L
JOG VD	O	IC503 ⑤	L	L	L	*5	*5	L	*5	*5	*5	*5	*5	*5	*5	*5	L	L	L	L	*5	*5	*5	*5
RP PB MODE	O	IC503 ③	H	H	H	H	H	H	H	H	H	H	H	H	H	H	L	H	H	L	H	H	H	H
FE ON	O	IC503 ④	H	H	H	H	H	H	H	H	H	H	H	H	H	H	L	H	H	L	H	H	H	H
RF SWP	O	IC503 (99)	L	*7	*7	*7	*7	*7	*7	*7	*7	*7	*7	*7	*7	*7	*7	*7	*7	*7	*7	*7	*7	*7
JOG	O	IC503 ⑥	L	L	L	H	H	L	H	H	H	H	H	H	H	H	L	L	L	L	H	H	H	H
VIDEO CS	O	IC506 ㊿	V period "L" pulse																					
VIDEO D/A CS	O	IC506 ㊽	V period 'H" pulse																					
DATA TO MSTR	I	IC506 ㊶	V period "L" pulse																					
DATA TO SLVE	O	IC506 ㊵	V period pulse train																					
SCK	I	IC506 ㊴	V period "H" pulse																					
PB SP/LP	I	IC503 (67)	L	*10	*10	*10	*10	L	*10	*10	*10			*10	L	*10	H	H	H	H	L	*10	L	*10
CLOG	I	IC503 (84)	H	*11	*11	*11	*11	*11	*11	*11	*11	*11	*11	*11	*11	*11	H	*11	*11	H	*11	*11	*11	*11
VTR SYNC	I	IC503 (66)	*12	*12	*12	*12	*12	*12	*12	*12	*12	*12	*12	*12	*12	*12	*12	*12	*12	*12	*12	*12	*12	*12

*1. Outputs discrimination result of the mode just before. "H": SP mode, "L": LP mode.
*2. Outputs discrimination result of the playback tape. "H" : SP mode, "L": LP mode.
*3. Edit search button pressed when playback pause mode.
*4. E, Australian, Tourist model only.
*5. False VD signal
*6. By REC MODE switch. "H" : SP mode, "L": LP mode.
*7. 25 Hz duty 50% pulse (synchronized with drum rotation)
*10. "H": SP recording area on tape. "L": LP recording area.
*11. "H": no recording area or drop out area on tape. Head clog detection input.
*12. Composite sync signal input separated from line input video signal, camera video signal or playback video signal. (polarity +)
*13. "H" during camera mode load/unload.
*14. "L" when external input (video) present. "H" when other cases.
*15. "H" when tape no signal. "L" when other cases.

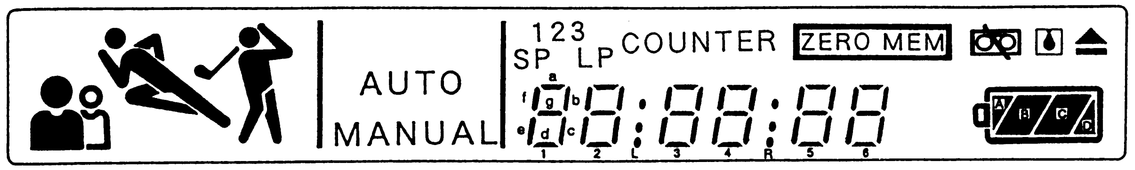
3-12-2. System Control – Servo Block Interface

NAME	I/O	No.	VTR MODE																CAMERA MODE					
			STOP	FF	REW	FR SEARCH		PB	PICTURE SEARCH		PB-PAUSE	FRAME	SLOW	X2	SHUTTLE EDIT *12		REC *13	REC PAUSE	STAND BY	REC *13	EDIT SEARCH		REC REVIEW	
						CUE	REVIEW		CUE	REVIEW					FWD	REV					FWD	RVS	FWD	RVS
T.REEL FG	I	IC503 (62)	–	*1	*1	*1	*1	*1	*1	*1	*1	*1	*1	*1	*1	*1	*1	–	–	*1	*1	*1	*1	*1
S.REEL FG	I	IC503 (61)	–	*1	*1	*1	*1	*1	*1	*1	*1	*1	*1	*1	*1	*1	*1	–	–	*1	*1	*1	*1	*1
ATF ERROR	I	IC503 (60)	–	*2	*2	*2	*2	*2	*2	*2	*2	*2	*2	*2	*2	*2	*2	*2	*2	*2	*2	*2	*2	*2
DRUM PG	I	IC503 (68)	–	*3	*3	*3	*3	*3	*3	*3	*3	*3	*3	*3	*3	*3	*3	*3	*3	*3	*3	*3	*3	*3
DRUM FG	I	IC503 (69)	–	*4	*4	*4	*4	*4	*4	*4	*4	*4	*4	*4	*4	*4	*4	*4	*4	*4	*4	*4	*4	*4
CAP FG/ CFG HMS	I	IC503 (70), (77)	–	*5	*5	*5	*5	*5	*5	*5	*5	*5	*5	*5	*5	*5	*5	*5	*5	*5	*5	*5	*5	*5
CAP ON	O	IC503 ①	L	H	H	H	H	H	H	H	L	*8	*8	H	H	H	H	L	L	H	H	H	H	H
REF PILOT	O	IC503 (85)	*7	*6	*6	*6	*6	*6	*6	*6	*6	*6	*6	*6	*6	*6	*6	*6	*6	*6	*6	*6	*6	*6
RP PB MODE	O	IC503 ③	H	H	H	H	H	H	H	H	H	H	H	H	H	H	L	H	H	L	H	H	H	H
DRUM FWD/$\overline{\text{RVS}}$ *10	O	IC503 ㉟	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H
CAP FWD/ $\overline{\text{RVS}}$	O	IC503 ②	L	H	L	H	L	H	H	L	L	*8	*8	H	H	L	H	L	L	H	H	L	H	L
DRUM PWM	O	IC503 (76)	*9	*9	*9	*9	*9	*9	*9	*9	*9	*9	*9	*9	*9	*9	*9	*9	*9	*9	*9	*9	*9	*9
CAP PWM	O	IC503 (75)	L	*9	*9	*9	*9	*9	*9	*9	L	*9	*9	*9	*9	*9	*9	L	L	*9	*9	*9	*9	*9
$\overline{\text{LM LIM CONT}}$ *11	O	IC503 ㉝	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L
DRUM ON	O	IC503 (83)	L	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H
DRUM ACC *14	O	IC503 (91)	L	L	L	L	L	L	L	L	L	L	*8	L	L	L	L	L	L	L	L	L	L	L
DRUM BRK	O	IC503 (92)	L	L	L	L	L	L	L	L	L	L	*8	L	L	L	L	L	L	L	L	L	L	L

*1. Inputting waveform which is similar to sine wave according to reel rotation.
*2. ATF error voltage input
*3. One PG pulse input per one drum rotation, approx. 25 Hz.
*4. 12 FG pulses input per one drum rotation, approx. 300 Hz.
*5. 520 FG pulses input per one capstan rotation. Approx. 1388 Hz when REC/PB (SP). 694 Hz when REC/PB (LP).
*6. Four frequencies output synchronized with drum rotation. f1=101.0 kHz, f2=117.2 kHz, f3=162.8 kHz and f4=146.5 kHz
*7. f2 (117.2 kHz) output
*8. "H" pulse when tape run.
*9. 21.5 μsec period PWM signal
*10. Normally "H". Temporary "L" when load (drum reverse rotation).
*11. Temporary "H" when cassette loading (finger catch protection).
*12. Edit search button pressed when playback pause mode.
*13. E, Australian, Tourist model only.
*14. Not used.

LCD Po

LCD Port Layout



CS-35 BOARD IC506		LCD				
Signal	**Pin No.**	**Pin No.**	**COM. 1**	**COM. 2**	**COM. 3**	**COM. 4**
COM3	24	1				COM. 4
COM2	23	2			COM. 3	
COM1	22	3		COM. 2		
COM0	21	4	COM. 1			
S22	11	5	AM	▯	| |	👥
S7	76	6	1f	1g	1e	1d
S8	77	7	1a	1b	1c	SP
S3	72	8	1			
S4	73	9	2			3
S9	78	10	2f	2g	2e	2d
S10	79	11	2a	2b	2c	LP
S5	74	12	: (L)	• (L)	AUTO	MANUAL
S11	80	13	3f	3g	3e	3d
S12	1	14	3a	3b	3c	COUNTER
S13	2	15	4f	4g	4e	4d
S14	3	16	4a	4b	4c	
S6	75	17	: (R)	• (R)	🏌	⛷
S15	4	18	5f	5g	5e	5d
S16	5	19	5a	5b	5c	ZERO MEM
S17	6	20	6f	6g	6e	6d
S18	7	21	6a	6b	6c	PM
S19	8	22	📼	◤ (A)	▰ (C)	
S20	9	23	💧		▭	⏏
S21	10	24		▰ (B)	◢ (D)	

Audio matrix control signal

Switches the internal switch of IC402 of the VA-74 board according to the position of the HiFi sound switch and the playback tape.

REC mode

Mode	AUDIO MATRIX CONTROL SIGNAL			RECORDING SIGNAL	
	MX ON/$\overline{\text{OFF}}$ (IC503 ㉖)	MX SEL 1 (IC503 ㉔)	MX SEL 2 (IC503 ㉕)	REC AFM 1.5 MHz	REC AFM 1.7 MHz
MONO *1	L	L	H	MONO	— *2
STEREO	H	—	—	$\frac{L+R}{2}$	$\frac{L-R}{2}$

*1. When the monaural mic is connected to the external mic jack (CAMERA mode) or when the plug is not inserted in the AUDIO IN R terminal. (VTR mode). AUDIO IN terminal is E, Australian, Tourist model only.

*2. The "1.7M OFF" signal of Pin ㊾ of IC503 becomes "H" and the REC AFM 1.7 MHz signal will not be recorded.

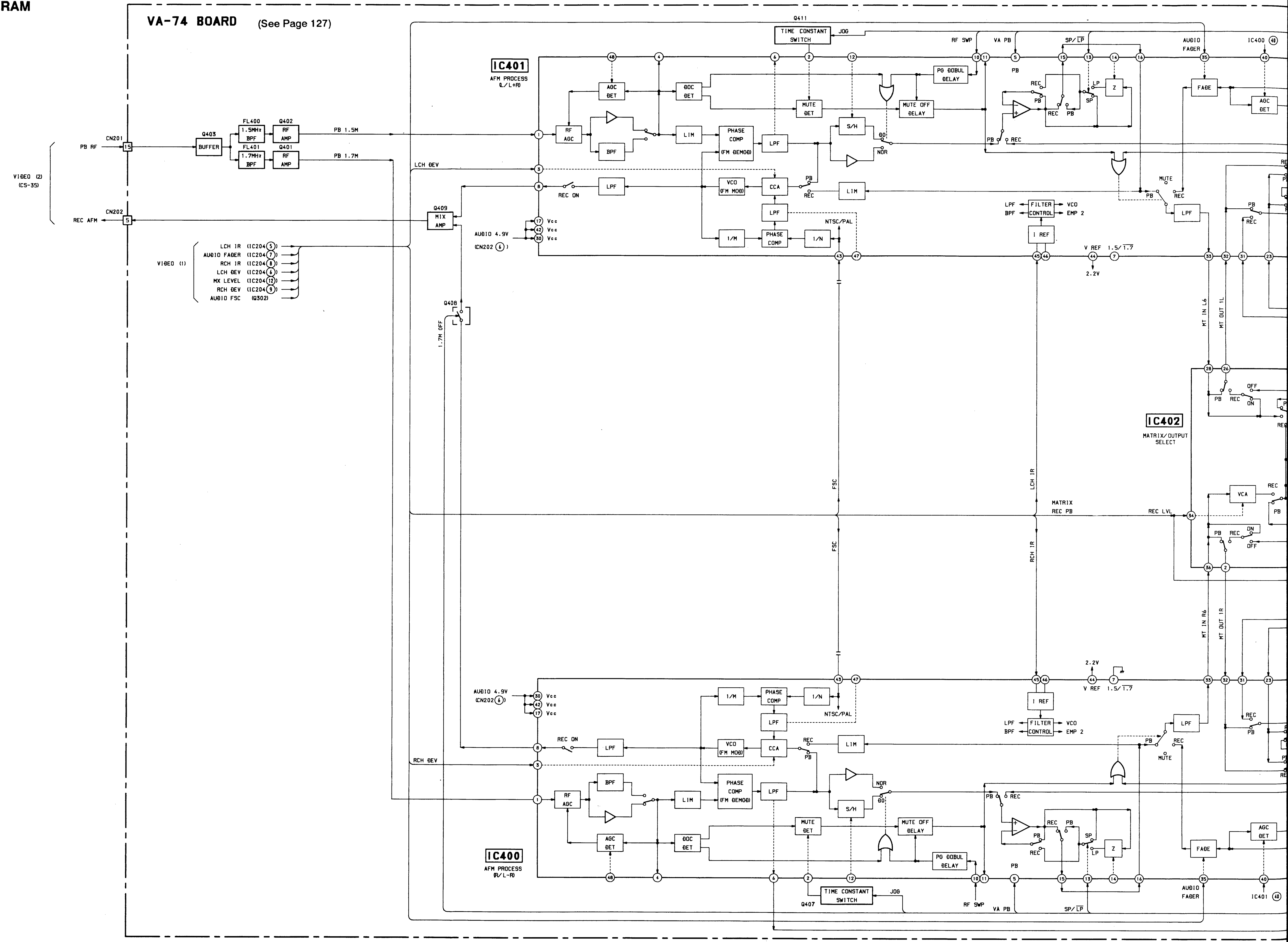
PB mode

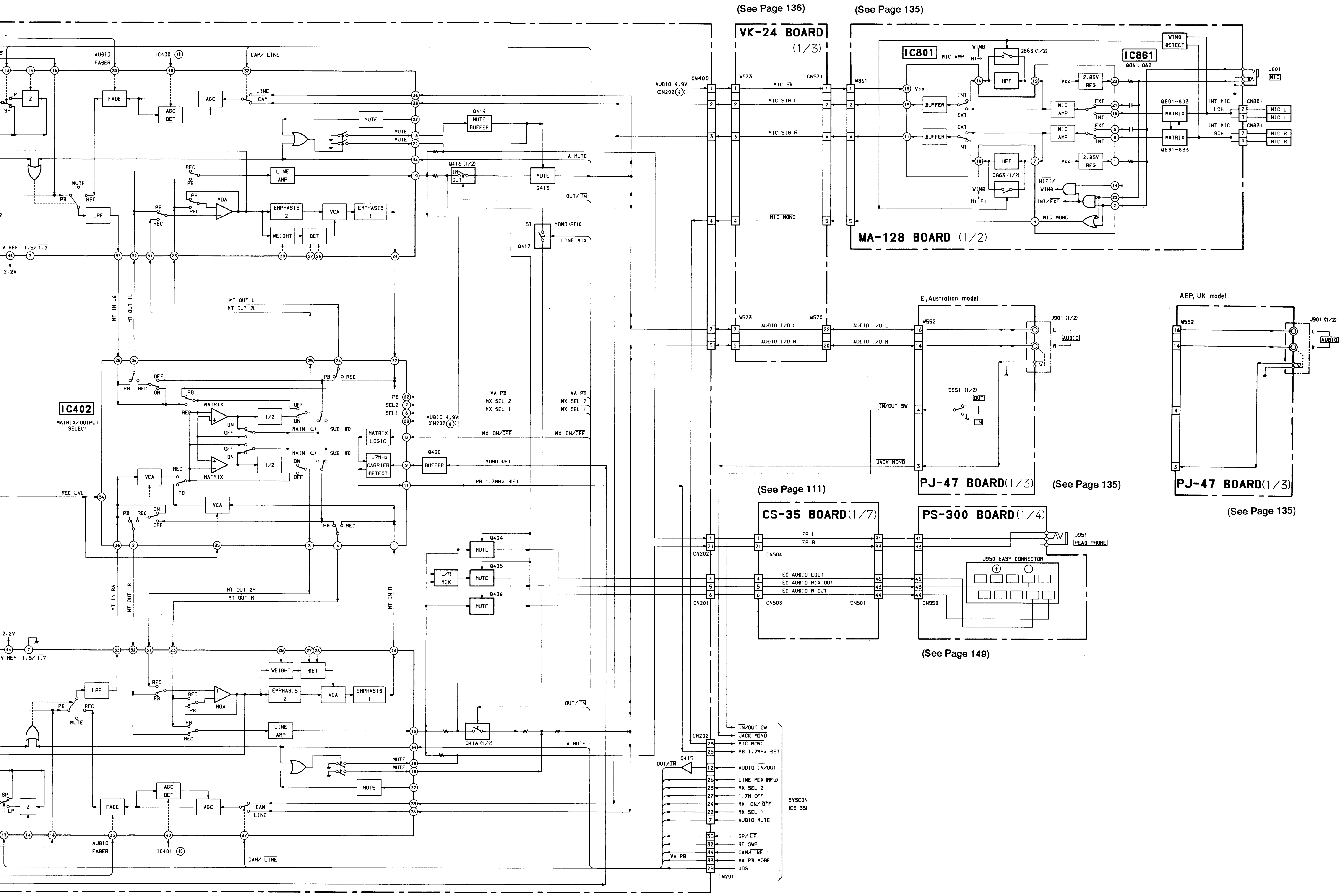
PLAYBACK TAPE	HiFi SOUND SWITCH (PJ-47 BOARD S552)	AUDIO MATRIX CONTROL SIGNAL			PLAYBACK SIGNAL *4	
		MX ON/$\overline{\text{OFF}}$ (IC503 ㉖)	MX SEL 1 (IC503 ㉔)	MX SEL 2 (IC503 ㉕)	L	R
MONO		L	L	H	MONO	MONO
STEREO	GREEN POSITION	H	L	L	L	R
	1	L	L	H	$\frac{L+R}{2}$ (=MONO)	$\frac{L+R}{2}$ (=MONO)
	2	L	H	L	$\frac{L-R}{2}$ *3	$\frac{L-R}{2}$ *3
BILINGUAL	GREEN POSITION	H	L	L	MAIN + SUB	MAIN – SUB
	1	L	L	H	MAIN	MAIN
	2	L	H	L	SUB	SUB

*3. An unnatural sound will be produced.

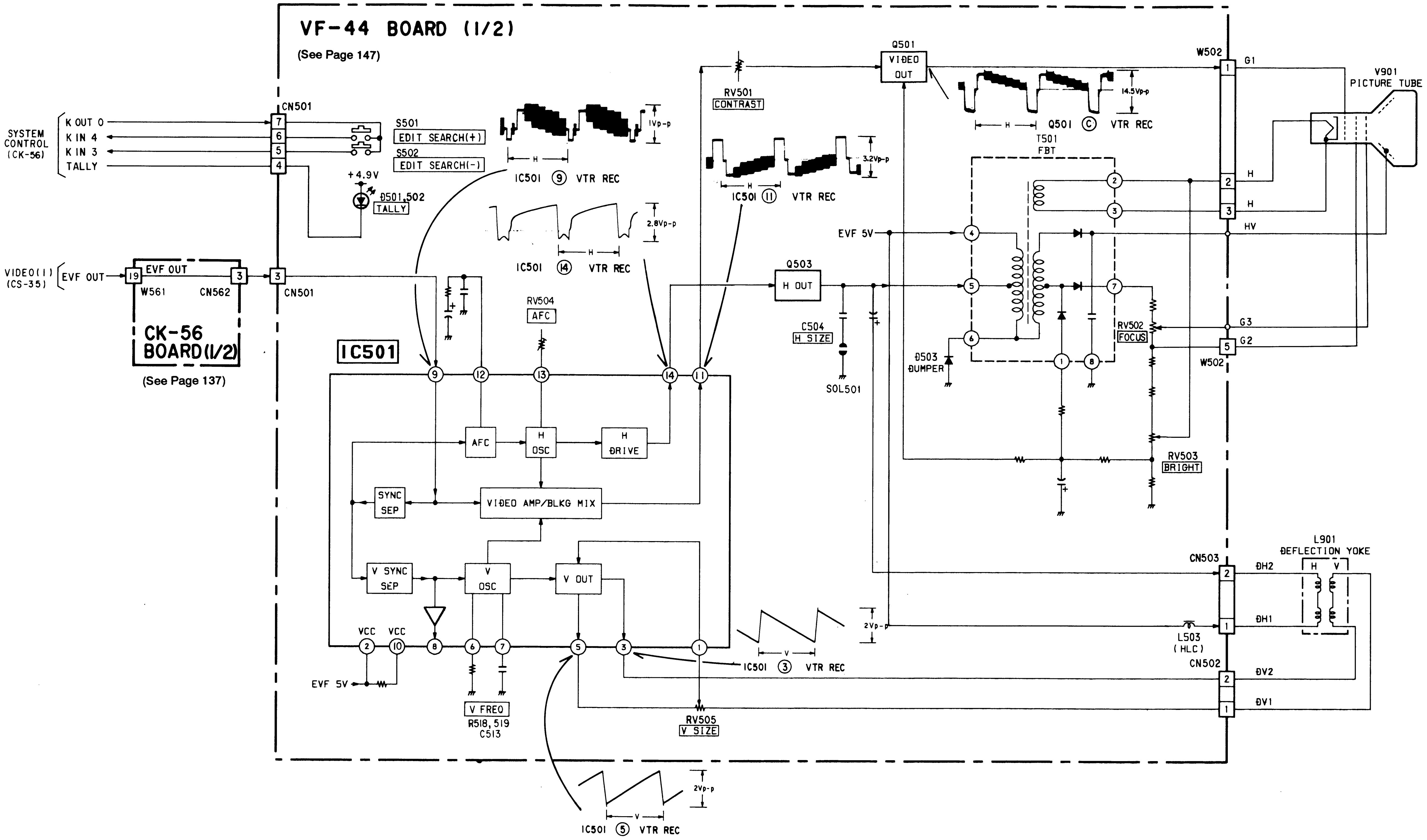
*4. When the plug is not inserted in the AUDIO OUT R terminal, the LINE MIX (RFU) signal of Pin ㉓ of IC503 becomes "H", and the AUDIO OUT L terminal will output the L, R mix signal.

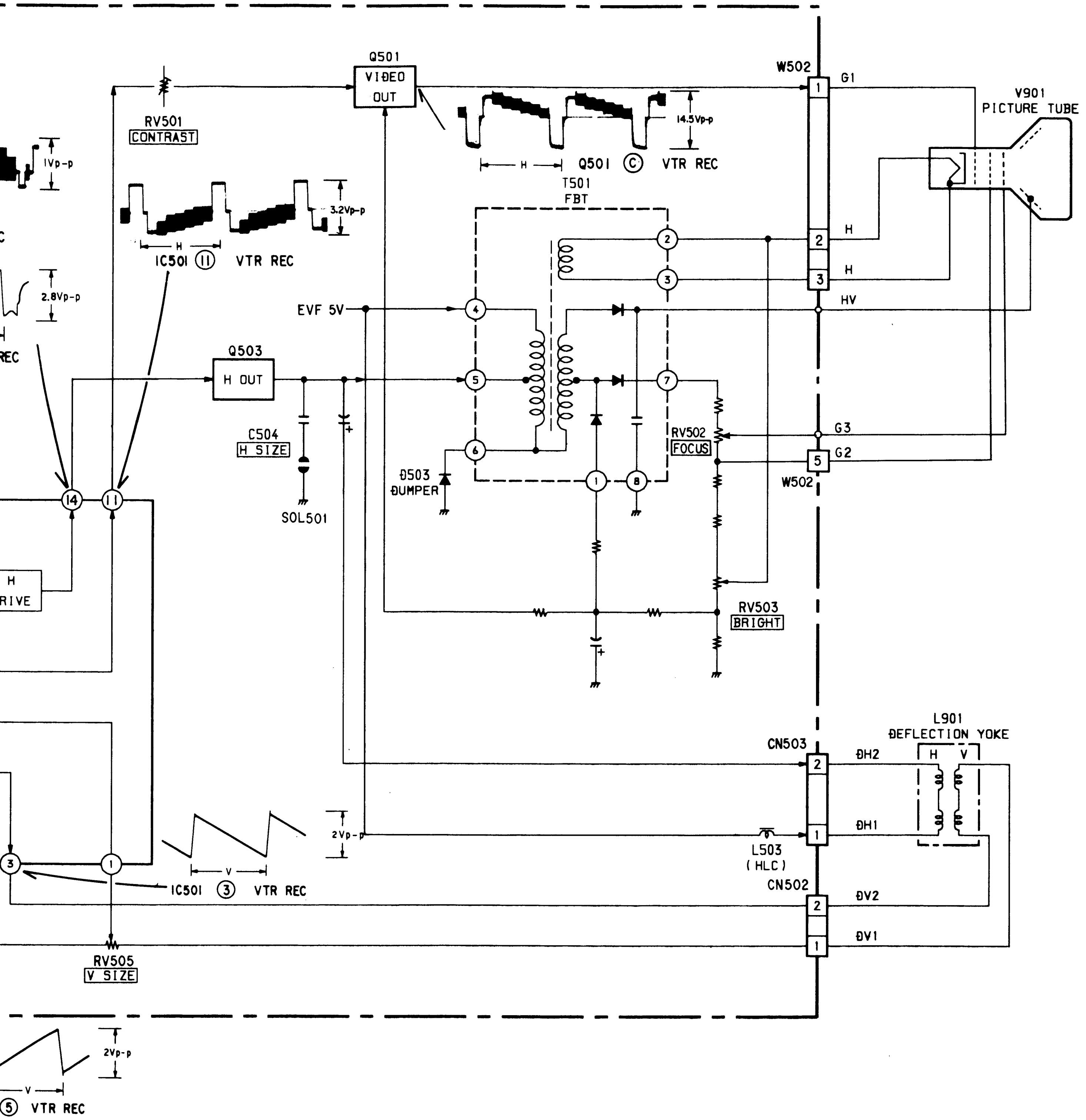
3-13. AUDIO BLOCK DIAGRAM


VA-74 BOARD
(See Page 127)
VIDEO (2) (CS-35)
CN201
PB RF
15
CN202
REC AFM
5
Q403
BUFFER
FL400
1.5MHz BPF
Q402
RF AMP
FL401
1.7MHz BPF
Q401
RF AMP
PB 1.5M
PB 1.7M
LCH DEV
RCH DEV
Q409
MIX AMP
VIDEO (1)
LCH IR (IC204⑤)
AUDIO FADER (IC204⑦)
RCH IR (IC204⑧)
LCH DEV (IC204⑥)
MX LEVEL (IC204⑫)
RCH DEV (IC204⑨)
AUDIO FSC (Q302)
Q408
1.7M OFF
AUDIO 4.9V
(CN202 ⑥)
Vcc
IC401
AFM PROCESS (L/L+R)
IC400
AFM PROCESS (R/L-R)
Q411
Q407
TIME CONSTANT SWITCH
JOG
RF SWP
VA PB
SP/LP
AUDIO FADER
IC400 ㊽
IC401 ㊽
RF AGC
AGC DET
DOC DET
BPF
LIM
PHASE COMP (FM DEMOD)
LPF
MUTE DET
MUTE OFF DELAY
PG DOBUL DELAY
S/H
DO
NOR
VCO (FM MOD)
CCA
REC ON
1/M
1/N
NTSC/PAL
FILTER CONTROL
I REF
EMP 2
V REF 1.5/1.7
2.2V
PB
REC
SP
LP
Z
MUTE
FADE
FSC
LCH IR
RCH IR
MT IN L6
MT OUT 1L
MT IN R6
MT OUT 1R
IC402
MATRIX/OUTPUT SELECT
MATRIX
REC PB
REC LVL
VCA
ON
OFF

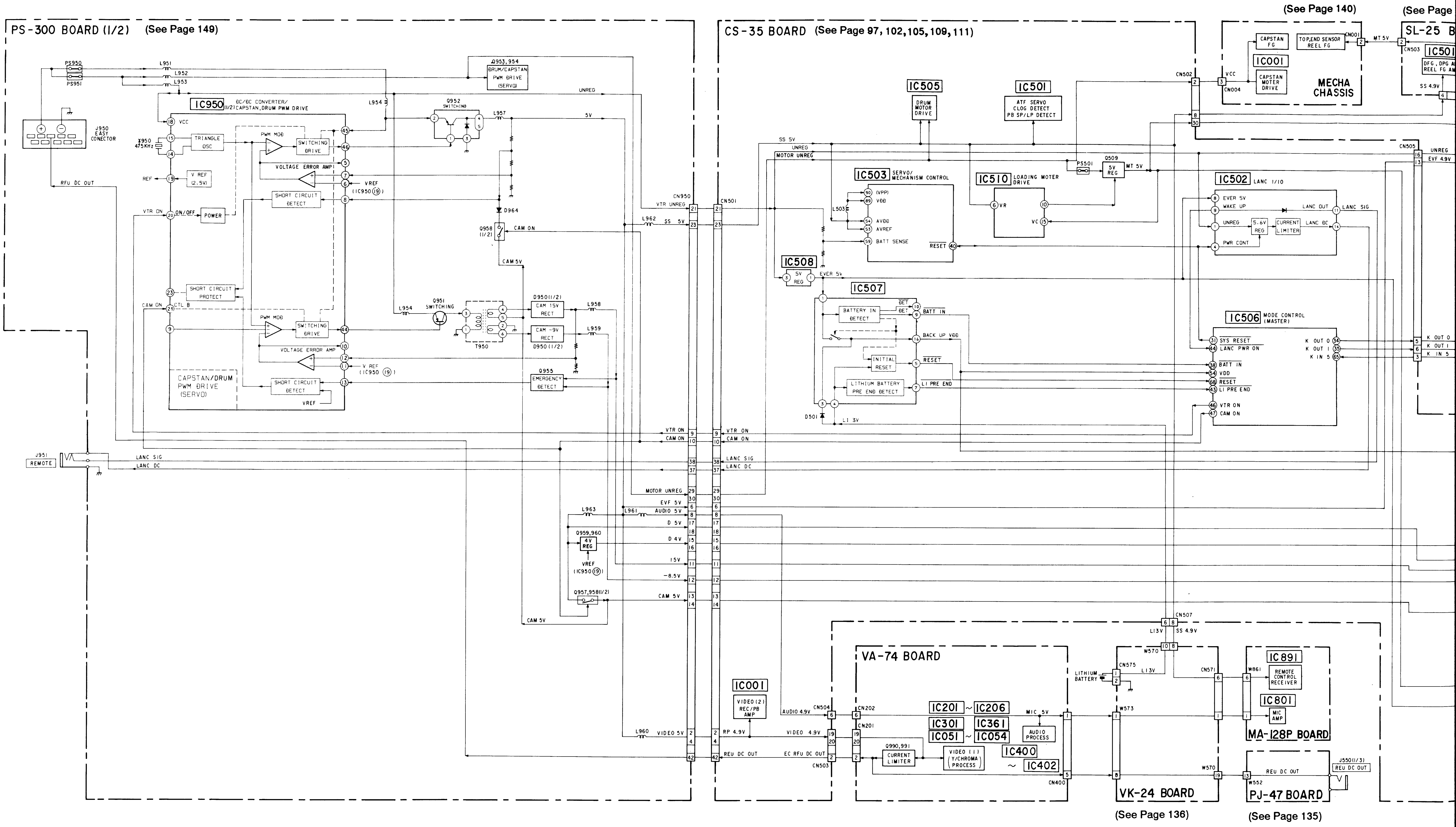

(See Page 136)
VK-24 BOARD (1/3)
(See Page 135)
MA-128 BOARD (1/2)
IC801 MIC AMP
IC861
Q861, 862
WIND DETECT
J801 MIC
Q863 (1/2)
HPF
BUFFER
MIC AMP
2.85V REG
Q801~803 MATRIX
Q831~833 MATRIX
INT MIC LCH
INT MIC RCH
CN801
CN831
MIC L
MIC R
MIC SIG L
MIC SIG R
MIC MONO
MIC 5V
W573
CN571
W861
CN400
AUDIO 4.9V (CN202 ⑥)
HIFI/WIND
INT/EXT
WIND
HI-FI
INT
EXT
Vcc
AUDIO FADER
IC400 ㊵
CAM/LINE
FADE
AGC
AGC DET
MUTE
Q414 MUTE BUFFER
LINE AMP
Q416 (1/2) IN OUT
Q413
A MUTE
OUT/IN
MOA
EMPHASIS 2
EMPHASIS 1
VCA
WEIGHT
DET
LPF
ST
MONO (RFU)
LINE MIX
Q417
V REF 1.5/1.7
2.2V
MT OUT L
MT OUT 2L
MT IN L6
MT OUT 1L
IC402
MATRIX/OUTPUT SELECT
MATRIX
1/2
MAIN (L)
SUB (R)
MATRIX LOGIC
1.7MHz CARRIER DETECT
Q400 BUFFER
VA PB
MX SEL 2
MX SEL 1
MX ON/OFF
MONO DET
PB 1.7MHz DET
REC LVL
PB
REC
ON
OFF
SEL2
SEL1
MT OUT 2R
MT OUT R
MT IN R6
MT OUT 1R
MT IN R
Q404
Q405
Q406
L/R MIX
IC401 ㊵
SP
LP
Z
E, Australian model
W552
J901 (1/2)
AUDIO
S551 (1/2)
OUT
IN
IN/OUT SW
JACK MONO
PJ-47 BOARD (1/3)
(See Page 135)
AEP, UK model
W570
AUDIO I/O L
AUDIO I/O R
(See Page 111)
CS-35 BOARD (1/7)
PS-300 BOARD (1/4)
J951 HEAD PHONE
EP L
EP R
J950 EASY CONNECTOR
EC AUDIO LOUT
EC AUDIO MIX OUT
EC AUDIO R OUT
CN504
CN503
CN501
CN950
CN201
CN202
(See Page 149)
Q415
IN/OUT SW
JACK MONO
MIC MONO
PB 1.7MHz DET
AUDIO IN/OUT
LINE MIX (RFU)
MX SEL 2
1.7M OFF
MX ON/OFF
MX SEL 1
AUDIO MUTE
SP/LP
RF SWP
CAM/LINE
VA PB MODE
JOG
SYSCON (CS-35)

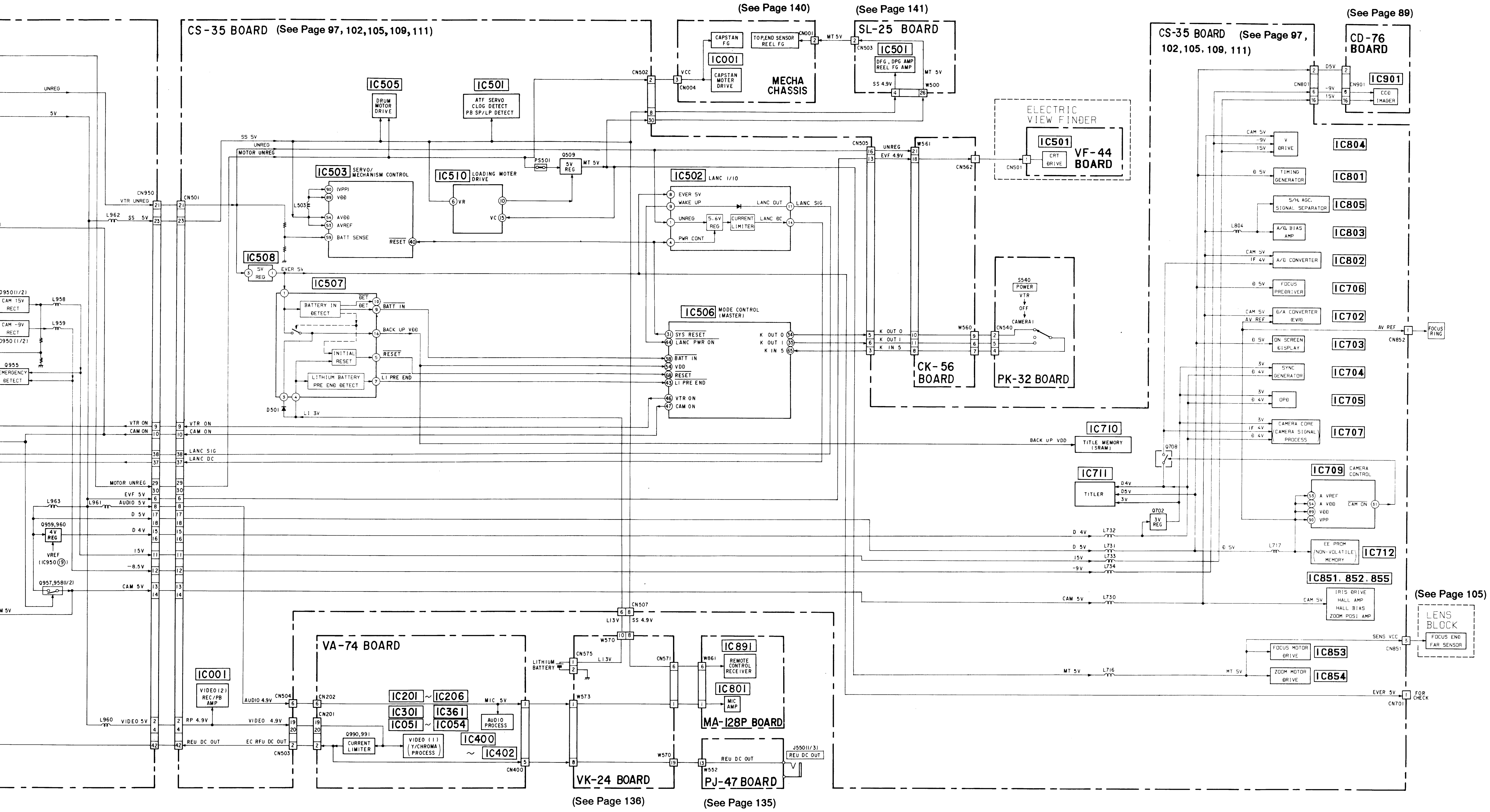
3-14. EVF BLOCK DIAGRAM


VF-44 BOARD (1/2)
(See Page 147)
SYSTEM CONTROL (CK-56)
K OUT 0
K IN 4
K IN 3
TALLY
CN501
S501 EDIT SEARCH(+)
S502 EDIT SEARCH(-)
+4.9V
D501,502 TALLY
VIDEO(1) (CS-35)
EVF OUT
EVF OUT
W561
CN562
CK-56 BOARD(1/2)
(See Page 137)
IC501
IC501 ⑨ VTR REC
1Vp-p
H
IC501 ⑭ VTR REC
2.8Vp-p
RV504 AFC
RV501 CONTRAST
IC501 ⑪ VTR REC
3.2Vp-p
Q501 VIDEO OUT
14.5Vp-p
Q501 Ⓒ VTR REC
T501 FBT
Q503 H OUT
C504 H SIZE
SOL501
D503 DUMPER
RV502 FOCUS
RV503 BRIGHT
EVF 5V
W502
G1
H
HV
G3
G2
V901 PICTURE TUBE
AFC
H OSC
H DRIVE
SYNC SEP
VIDEO AMP/BLKG MIX
V SYNC SEP
V OSC
V OUT
VCC
VCC
EVF 5V
V FREQ
R518, 519
C513
RV505 V SIZE
IC501 ③ VTR REC
2Vp-p
V
L503 (HLC)
CN503
CN502
DH2
DH1
DV2
DV1
L901 DEFLECTION YOKE
IC501 ⑤ VTR REC
2Vp-p


Q501
VIDEO OUT
RV501
CONTRAST
1Vp-p
3.2Vp-p
H
IC501 ⑪ VTR REC
14.5Vp-p
H
Q501 Ⓒ VTR REC
T501
FBT
W502
G1
V901
PICTURE TUBE
H
H
HV
EVF 5V
2.8Vp-p
REC
Q503
H OUT
C504
H SIZE
SOL501
D503
DUMPER
RV502
FOCUS
G3
G2
W502
H
DRIVE
RV503
BRIGHT
L901
DEFLECTION YOKE
CN503
DH2
H
V
DH1
2Vp-p
L503
(HLC)
CN502
DV2
DV1
V
IC501 ③ VTR REC
RV505
V SIZE
2Vp-p
V
⑤ VTR REC

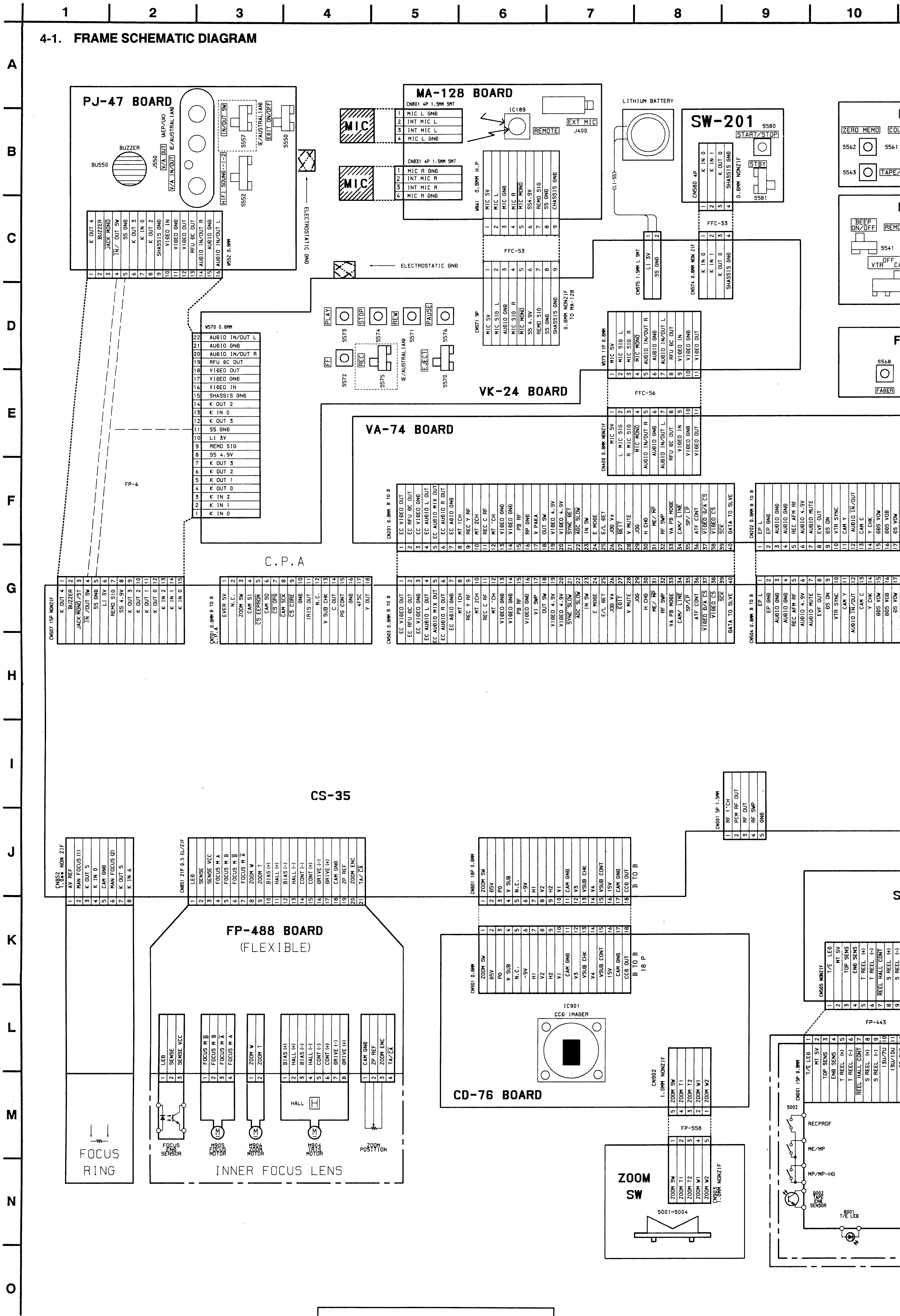
3-15. POWER BLOCK DIAGRAM


PS-300 BOARD (1/2) (See Page 149)
CS-35 BOARD (See Page 97, 102, 105, 109, 111)
(See Page 140)
(See Page
SL-25
MECHA CHASSIS
IC001
CAPSTAN FG
TOP,END SENSOR REEL FG
CAPSTAN MOTER DRIVE
IC950 DC/DC CONVERTER/(1/2) CAPSTAN,DRUM PWM DRIVE
J950 EASY CONECTOR
X950 475KHz
TRIANGLE OSC
V REF (2.5V)
POWER
PWM MOD
SWITCHING DRIVE
VOLTAGE ERROR AMP
SHORT CIRCUIT DETECT
SHORT CIRCUIT PROTECT
CAPSTAN/DRUM PWM DRIVE (SERVO)
Q953,954 DRUM/CAPSTAN PWM DRIVE (SERVO)
Q952 SWITCHING
Q951 SWITCHING
T950
D950(1/2) CAM 15V RECT
CAM -9V RECT
Q955 EMERGENCY DETECT
Q958 (1/2)
D964
Q959,960 4V REG
Q957,958(1/2)
J951 REMOTE
RFU DC OUT
VTR ON
CAM ON
LANC SIG
LANC DC
UNREG
5V
CAM 5V
MOTOR UNREG
EVF 5V
AUDIO 5V
D 5V
D 4V
15V
-8.5V
VIDEO 5V
CN950
CN501
IC505 DRUM MOTOR DRIVE
IC501 ATF SERVO CLOG DETECT PB SP/LP DETECT
IC503 SERVO/MECHANISM CONTROL
IC510 LOADING MOTER DRIVE
IC508 5V REG
IC507
BATTERY IN DETECT
INITIAL RESET
LITHIUM BATTERY PRE END DETECT
IC502 LANC I/O
5.6V REG
CURRENT LIMITER
IC506 MODE CONTROL (MASTER)
Q509 5V REG
PS501
MT 5V
SS 5V
EVER 5V
SS 4.9V
LI 3V
CN502
CN505
CN507
IC001 VIDEO(2) REC/PB AMP
VA-74 BOARD
IC201 ~ IC206
IC301 IC361
IC051 ~ IC054
Q990,991 CURRENT LIMITER
VIDEO(1) Y/CHROMA PROCESS
AUDIO PROCESS
IC400 ~ IC402
LITHIUM BATTERY
VK-24 BOARD
(See Page 136)
IC891 REMOTE CONTROL RECEIVER
IC801 MIC AMP
MA-128P BOARD
PJ-47 BOARD
(See Page 135)
J550(1/3) REU DC OUT


CS-35 BOARD (See Page 97, 102, 105, 109, 111)
(See Page 140)
MECHA CHASSIS
CAPSTAN FG
TOP,END SENSOR REEL FG
IC001
CAPSTAN MOTER DRIVE
CN001
CN004
VCC
MT 5V
(See Page 141)
SL-25 BOARD
IC501
DFG, DPG AMP REEL FG AMP
SS 4.9V
MT 5V
W500
CN503
CN502
IC505
DRUM MOTOR DRIVE
IC501
ATF SERVO CLOG DETECT PB SP/LP DETECT
SS 5V
UNREG
MOTOR UNREG
PS501
Q509
5V REG
MT 5V
IC503 SERVO/MECHANISM CONTROL
(VPP)
VDD
AVDD
AVREF
BATT SENSE
RESET
L503
IC510 LOADING MOTER DRIVE
VR
VC
IC502 LANC I/O
EVER 5V
WAKE UP
UNREG
5.6V REG
CURRENT LIMITER
LANC OUT
LANC DC
LANC SIG
PWR CONT
IC508
5V REG
EVER 5V
IC507
BATTERY IN DETECT
DET
BATT IN
BACK UP VDD
INITIAL RESET
RESET
LITHIUM BATTERY PRE END DETECT
LI PRE END
D501
LI 3V
IC506 MODE CONTROL (MASTER)
SYS RESET
LANC PWR ON
BATT IN
VDD
RESET
LI PRE END
VTR ON
CAM ON
K OUT 0
K OUT 1
K IN 5
CN950
VTR UNREG
L962
SS 5V
CN501
UNREG
5V
Q950(1/2)
CAM 15V RECT
L958
CAM -9V RECT
Q950(1/2)
L959
Q955
EMERGENCY DETECT
VTR ON
CAM ON
LANC SIG
LANC DC
MOTOR UNREG
EVF 5V
L963
L961
AUDIO 5V
D 5V
Q959,960
4V REG
D 4V
VREF (IC950 ⑲)
15V
-8.5V
Q957,958(1/2)
CAM 5V
M 5V
L960
VIDEO 5V
RP 4.9V
REU DC OUT
IC001
VIDEO(2) REC/PB AMP
AUDIO 4.9V
CN504
VIDEO 4.9V
EC RFU DC OUT
CN503
VA-74 BOARD
CN202
CN201
IC201 ~ IC206
IC301 IC361
IC051 ~ IC054
IC400 ~ IC402
Q990,991
CURRENT LIMITER
VIDEO (1) Y/CHROMA PROCESS
MIC 5V
AUDIO PROCESS
CN400
CN507
LI3V
SS 4.9V
W570
CN575
LITHIUM BATTERY
W573
VK-24 BOARD
(See Page 136)
CN571
W861
IC891
REMOTE CONTROL RECEIVER
IC801
MIC AMP
MA-128P BOARD
W570
W552
REU DC OUT
J550(1/3) REU DC OUT
PJ-47 BOARD
(See Page 135)
CN505
UNREG
EVF 4.9V
W561
CN562
ELECTRIC VIEW FINDER
IC501
CRT DRIVE
CN501
VF-44 BOARD
W560
CN540
K OUT 0
K OUT 1
K IN 5
CK-56 BOARD
S540 POWER
VTR
OFF
CAMERA
PK-32 BOARD
CS-35 BOARD (See Page 97, 102, 105, 109, 111)
(See Page 89)
CD-76 BOARD
CN801
CN901
D5V
-9V
15V
IC901
CCD IMAGER
CAM 5V
-9V
15V
V DRIVE
IC804
D 5V
TIMING GENERATOR
IC801
S/H, AGC, SIGNAL SEPARATOR
IC805
L804
A/D BIAS AMP
IC803
CAM 5V
IF 4V
A/D CONVERTER
IC802
D 5V
FOCUS PREDRIVER
IC706
CAM 5V
AV REF
D/A CONVERTER (EVR)
IC702
AV REF
CN852
FOCUS RING
D 5V
ON SCREEN DISPLAY
IC703
3V
D 4V
SYNC GENERATOR
IC704
3V
D 4V
OPD
IC705
3V
IF 4V
D 4V
CAMERA CORE (CAMERA SIGNAL PROCESS)
IC707
IC710
BACK UP VDD
TITLE MEMORY (SRAM)
Q708
IC711
TITLER
D4V
D5V
3V
Q702
3V REG
IC709 CAMERA CONTROL
A VREF
A VDD
VDD
VPP
CAM ON
D 4V
L732
D 5V
L731
15V
L733
-9V
L734
D 5V
L717
EE PROM (NON-VOLATILE MEMORY)
IC712
IC851, 852, 855
CAM 5V
L730
CAM 5V
IRIS DRIVE
HALL AMP
HALL BIAS
ZOOM POSI AMP
(See Page 105)
LENS BLOCK
SENS VCC
CN851
FOCUS END FAR SENSOR
FOCUS MOTOR DRIVE
IC853
MT 5V
L716
MT 5V
ZOOM MOTOR DRIVE
IC854
EVER 5V
CN701
FOR CHECK

SECTION 4
PRINTED WIRING BOARDS AND SCHEMATIC DIAGRAMS

4-1. FRAME SCHEMATIC DIAGRAM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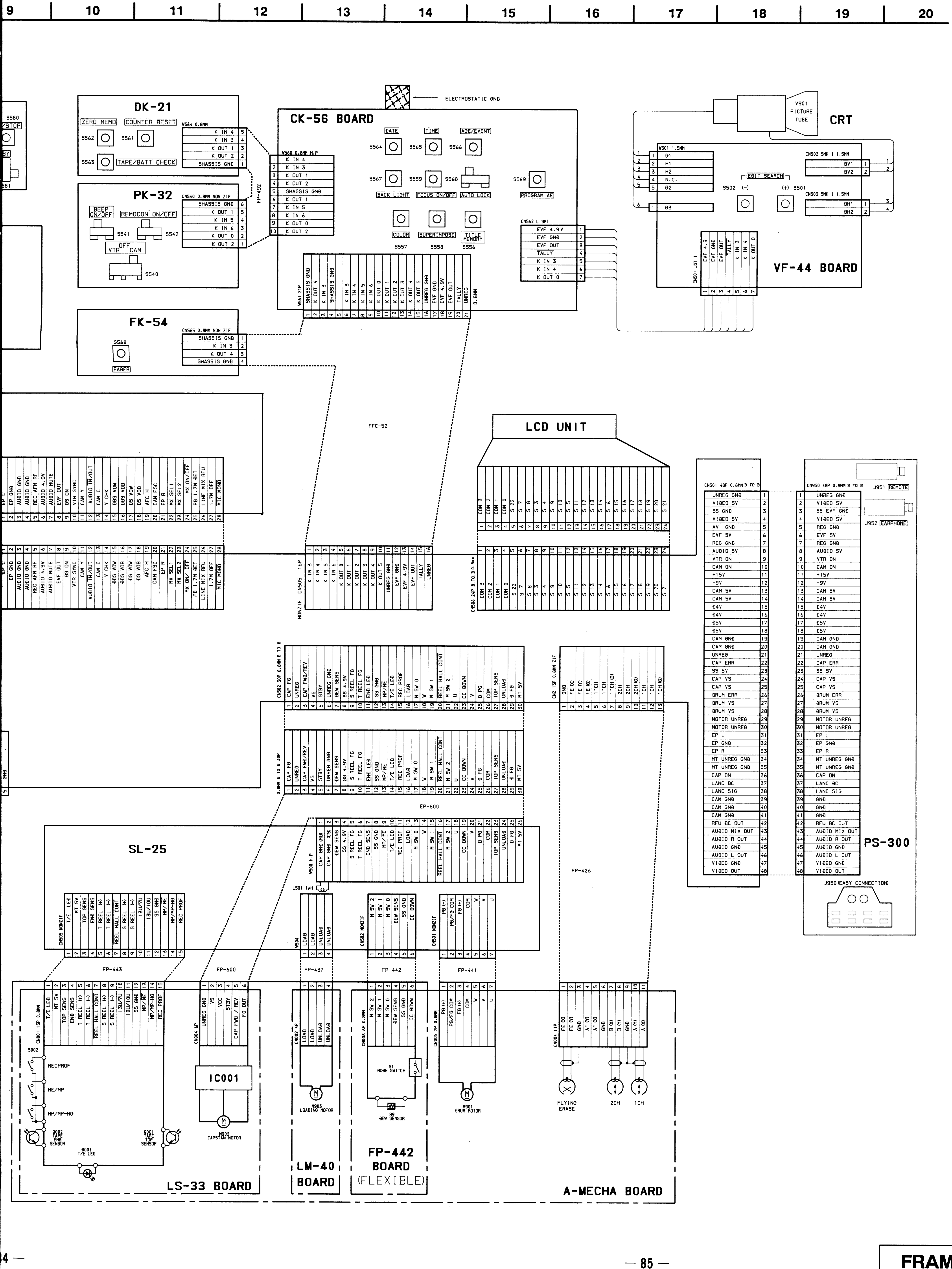
A
B
C
D
E
F
G
H
I
J
K
L
M
N
O
PJ-47 BOARD
BUZZER
BU550
J550
V/A OUT (AEP/UK)
V/A IN/OUT (E/AUSTRALIAN)
IN/OUT SW
S557
HIFI SOUND-1-2
S552
E/AUSTRALIAN
EDIT ON/OFF
S550
W552 0.8MM
ELECTROSTATIC GND
MA-128 BOARD
CN801 4P 1.5MM SMT
MIC L GND
INT MIC L
INT MIC L
MIC L GND
CN831 4P 1.5MM SMT
MIC R GND
INT MIC R
INT MIC R
MIC R GND
MIC
MIC
IC189
REMOTE
EXT MIC
J400
W861 0.8MM H.P
MIC 5V
MIC L
MIC GND
MIC R
MIC MONO
SS4.9V
REMO SIG
SS GND
CHASSIS GND
FFC-53
CN571 9P
0.8MM NONZIF TO MA-128
LITHIUM BATTERY
(LI-55)
CN575 1.5MM L SMT
LI 3V
SS GND
SW-201
S580
START/STOP
STBY
S581
CN580 4P
K IN 0
K IN 1
K OUT 0
SHASSIS GND
0.8MM NONZIF
FFC-33
CN574 0.8MM NON ZIF
PLAY
STOP
REW
PAUSE
FF
REC
EJECT
S573
S574
S571
S576
S572
S575
S570
(E/AUSTRALIAN)
VK-24 BOARD
W573 11P 0.8MM
FFC-56
W570 0.8MM
AUDIO IN/OUT L
AUDIO GND
AUDIO IN/OUT R
RFU DC OUT
VIDEO OUT
VIDEO GND
VIDEO IN
SHASSIS GND
K OUT 2
K IN 0
K OUT 3
SS GND
LI 3V
REMO SIG
SS 4.9V
K OUT 3
K OUT 2
K OUT 1
K OUT 0
K IN 2
K IN 1
K IN 0
FP-6
VA-74 BOARD
CN400 0.8MM NONZIF
CN201 0.8MM B TO B
EC VIDEO OUT
EC RFU DC OUT
EC VIDEO GND
EC AUDIO L OUT
EC AUDIO MIX OUT
EC AUDIO R OUT
EC AUDIO GND
MT 1CH
REC Y RF
MT 2CH
REC C RF
MT 'CH
VIDEO GND
PB RF
RP GND
V PAKA
OUT SW
VIDEO 4.9V
SYNC DET
AGC SLOW
IN SW
E MODE
E/L DET
JOG Vd
V MUTE
JOG
H CHG
ME/MP
RF SWP
VA PB MODE
CAM/LINE
SP/LP
ATF CONT
VIDEO D/A CS
VIDEO CS
SCK
DATA TO SLVE
CN202 0.8MM B TO B
EP L
EP GND
AUDIO GND
REC AFM RF
AUDIO 4.9V
AUDIO MUTE
EVF OUT
DS ON
VTR SYNC
CAM Y
AUDIO IN/OUT
CAM C
Y CHK
DDS VDW
DDS VDB
C.P.A
CN507 15P NONZIF
K OUT 4
BUZZER
JACK MONO/ST
IN /OUT SW
SS GND
LI 3V
REMO SIG
SS 4.9V
K OUT 3
K OUT 2
K OUT 1
K OUT 0
K IN 2
K IN 1
K IN 0
CN701 0.8MM B TO B
EVER 5V
N.C.
ZOOM SW
CAM SI
CAM SO
CS EEPROM
CS DPG
CAM SCK
CS CORE
GND
IRIS OUT
N.C.
V SUB CHK
C OUT
PG CONT
GND
4FSC
Y OUT
CN503 0.8MM B TO B
CN504 0.8MM B TO B
CS-35
CN001 5P 1.5MM
RF 1'CH
PCM RF OUT
RF OUT
RF SWP
GND
CN852 1.0MM NON ZIF
AV REF
MAN FOCUS (1)
K OUT 5
K IN 0
CAM GND
MAN FOCUS (2)
K OUT 5
K IN 6
CN851 21P 0.5 EL/ZIF
LED
SENSE
SENSE VCC
FOCUS M A
FOCUS M B
FOCUS M Ā
FOCUS M B̄
ZOOM T
ZOOM V
BIAS (+)
HALL (+)
BIAS (-)
HALL (-)
CONT (+)
DRIVE (-)
DRIVE (+)
CAM GND
ZP REF
ZOOM ENC
TA/CA
CN801 18P 0.8MM
ZOOM SW
05V
PG
V SUB
N.C.
-9V
H1
V2
H2
V1
CAM GND
V3
VSUB CHK
V4
VSUB CONT
15V
CAM GND
CCD OUT
B TO B
CN901 0.8MM
B TO B 18 P
FP-488 BOARD
(FLEXIBLE)
HALL
FOCUS ENC SENSOR
M905 FOCUS MOTOR
M906 ZOOM MOTOR
M904 IRIS MOTOR
ZOOM POSITION
INNER FOCUS LENS
FOCUS RING
IC901
CCD IMAGER
CD-76 BOARD
CN902 1.0MM NONZIF
ZOOM SW
ZOOM T1
ZOOM T2
ZOOM W1
ZOOM W2
FP-558
CN903 1.0MM NONZIF
ZOOM SW
S001~S004
CN505 NONZIF
T/E LED
MT 5V
TOP SENS
END SENS
T REEL (+)
T REEL (-)
REEL HALL CONT
S REEL (+)
S REEL (-)
FP-443
CN001 15P 0.8MM
S002
RECPROF
ME/MP
MP/MP-HG
Q002 TAPE END SENSOR
D001 T/E LED
ZERO MEMO
S562
S561
S563
TAPE
BEEP ON/OFF
REMO
S541
VTR
OFF
S568
FADER


9
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15
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17
18
19
20
DK-21
ZERO MEMO
COUNTER RESET
TAPE/BATT CHECK
S562
S561
S563
W564 0.8MM
K IN 4
K IN 3
K OUT 1
K OUT 2
SHASSIS GND
PK-32
BEEP ON/OFF
REMOCON ON/OFF
VTR OFF CAM
S541
S542
S540
CN540 0.8MM NON ZIF
FP-492
FK-54
S568
FADER
CN565 0.8MM NON ZIF
CK-56 BOARD
ELECTROSTATIC GND
DATE
TIME
AGE/EVENT
S564
S565
S566
S567
S559
S568
S569
BACK LIGHT
FOCUS ON/OFF
AUTO LOCK
PROGRAM AE
COLOR
SUPERIMPOSE
TITLE MEMORY
S557
S558
S556
W560 0.8MM H.P
CN562 L SMT
EVF 4.9V
EVF GND
EVF OUT
TALLY
K IN 3
K IN 4
K OUT 0
W561 21P
UNREG
CRT
V901 PICTURE TUBE
VF-44 BOARD
W501 1.5MM
G1
H1
H2
N.C.
G2
G3
CN502 SMK I 1.5MM
DV1
DV2
CN503 SMK I 1.5MM
DH1
DH2
EDIT SEARCH
S502 (-)
(+) S501
CN501 JST 1
FFC-52
LCD UNIT
NONZIF CN505 16P
CN506 24P B.TO.B 0.8MM
COM 3
COM 2
COM 1
COM 0
CN501 48P 0.8MM B TO B
CN950 48P 0.8MM B TO B
J951 REMOTE
J952 EARPHONE
PS-300
J950 (EASY CONNECTION)
UNREG GND
VIDEO 5V
SS GND
AV GND
EVF 5V
REG GND
AUDIO 5V
VTR ON
CAM ON
+15V
-9V
CAM 5V
D4V
D5V
CAM GND
CAP ERR
SS 5V
CAP VS
DRUM ERR
DRUM VS
MOTOR UNREG
EP L
EP GND
EP R
MT UNREG GND
CAP ON
LANC DC
LANC SIG
RFU DC OUT
AUDIO MIX OUT
AUDIO R OUT
AUDIO GND
AUDIO L OUT
VIDEO GND
VIDEO OUT
CN502 30P 0.8MM B TO B
CN2 13P 0.8MM ZIF
CAP FG
CAP FWD/REV
VS
STBY
DEW SENS
T REEL FG
S REEL FG
END LED
MP/ME
T/E LED
REC PROOF
LOAD
M SW 0
M SW 1
M SW 2
REEL HALL CONT
CC DOWN
D PG
TOP SENS
UNLOAD
D FG
MT 5V
EP-600
SL-25
W500 H.P
L501 1mH
CN505 NONZIF
CN502 NONZIF
CN501 NONZIF
W504
FP-426
FP-443
FP-600
FP-437
FP-442
FP-441
CN001 15P 0.8MM
S002
RECPROF
ME/MP
MP/MP-HG
Q002 TAPE END SENSOR
Q001 TAPE TOP SENSOR
D001 T/E LED
LS-33 BOARD
CN004 6P
IC001
M902 CAPSTAN MOTOR
CN002 4P
M903 LOADING MOTOR
LM-40 BOARD
CN003 6P 0.8MM
S1 MODE SWITCH
R9 DEW SENSOR
FP-442 BOARD (FLEXIBLE)
CN005 7P 0.8MM
M901 DRUM MOTOR
CN004 11P
FE (X)
FE (Y)
A (X)
A (Y)
B (X)
B (Y)
FLYING ERASE
2CH
1CH
A-MECHA BOARD

4-2. PRINTED WIRING BOARDS AND SCHEMATIC DIAGRAMS

THIS NOTE IS COMMON FOR PRINTED WIRING BOARDS AND SCHEMATIC DIAGRAMS.
(In addition to this , the necessary note is printed in each block.)

- **For printed wiring boards.**
- ○ : Through hole
- ▨ : Pattern from the side which enables seeing.
  (The other layer's patterns are not indicated.)

* Caution:	
Pattern face side: (Conductor Side)	Parts on the pattern face side seen from the pattern face are indicated.
Parts face side: (Component side)	Parts on the parts face side seen from the parts face are indicated.

- **For schematic diagrams.**
- Caution when replacing chip parts.
  New parts must be attached after removal of chip.
  Be careful not to heat the minuts side of tantalum capacitor, because it is damaged by the heat.
- Chip resistor are 1/16W unless otherwise noted.
  kΩ : 1000Ω , MΩ : 1000kΩ .
- All capacitors are in μF unless otherwise noted. pF: μ μF.
  50V or less are not indicated except for electrolytics and tantalums.
- All variable and adjustable resistors have characteristic curve B, unless otherwise noted.
- ⊡ : nonflammable resistor.
- ⊟ : fusible resistor.
- ▭ : panel designation.
- △ : internal component.
- ▭ : adjustment for repeair.*
- ━ : B+ Line.*
- - - - : B– Line.*
- ⇨ : IN/OUT direction of (+, –) B LINE.*
- Circled numbers refer to waveforms.*

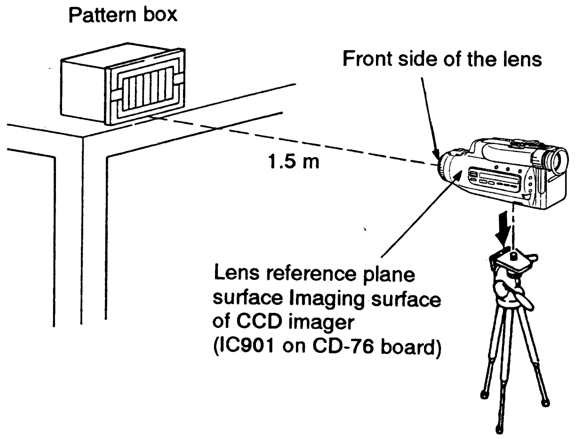
Note:
The components identi- fied by mark ⚠ or dotted line with mark ⚠ are critical for safty.
Replace only with part number specified.

When indicating parts by reference number, please include the board name.

• Measuring conditions voltage value and waveform.
(CAMERA, DIGITAL TITLE block)

- The object is color bar chart of pattern box.
- Voltages are dc between ground and measurement points.*
  Readings are taken with a digital multimeter (DC 10MΩ).*
- Voltage variations may be noted due to normal production tolerances.*

1. Connection


Pattern box
Front side of the lens
1.5 m
Lens reference plane surface Imaging surface of CCD imager (IC901 on CD-76 board)

2. Adjust the distance so that the output waveform of Fig. a and the Fig. b can be obtain.

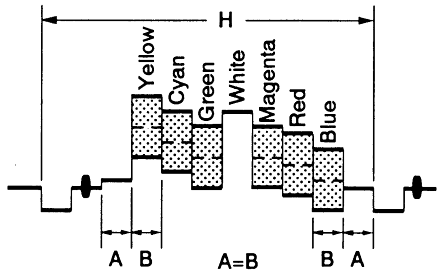

H
Yellow
Cyan
Green
White
Magenta
Red
Blue
A
B
A=B
B
A

Fig. a (Video output terminal output waveform)

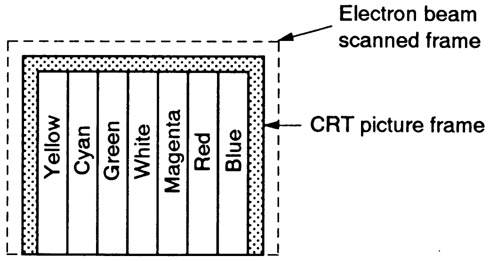

Electron beam scanned frame
CRT picture frame
Yellow
Cyan
Green
White
Magenta
Red
Blue

Fig. (Picture on monitor TV)

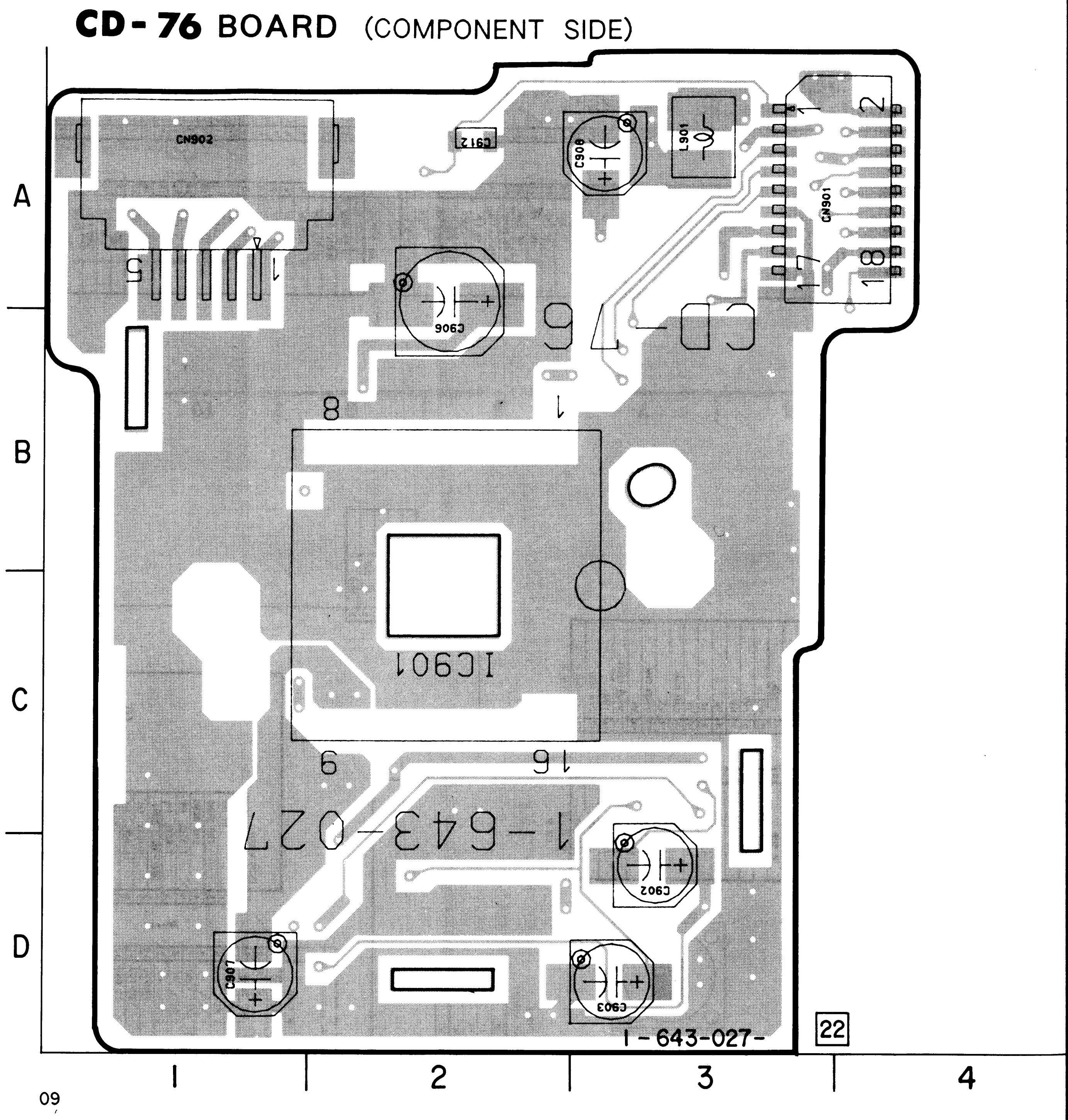
(VIDEO, SERVO/SYSTEM CONTROL, VIEW FINDER block)

- Voltages are dc between ground and measurement points.*
- Readings are taken with a color-bar signal input.*
- Readings are taken with a digital multimeter (DC10MΩ).*
- Voltage variations may be noted due to normal production tolerances.*

*: indicated by the color red.

CD-76 (CCD DRIVE) PRINTED WIRING BOARD

— Ref. No. CD-76 BOARD: 1000 series —


CD-76 BOARD (COMPONENT SIDE)
CN902
C912
C906
L901
CN901
C905
IC901
C902
C903
C907
1-643-027
1-643-027-
22
A
B
C
D
1
2
3
4
09

(DIODE)

D901	8-719-820-05	DIODE	1SS181
D903	8-719-820-05	DIODE	1SS181
D904	8-719-800-76	DIODE	1SS226

(TRANSISTOR)

Q901	8-729-602-21	TRANSISTOR	2SC4154-F
Q902	8-729-402-13	TRANSISTOR	XN1501
Q903	8-729-232-86	TRANSISTOR	2SK1875

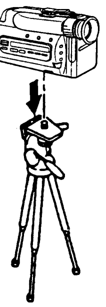
waveform.

nt points.*

l0MΩ).*

nal production

the lens



of Fig. a and

orm)

am

me

me

W FINDER

nt points.*

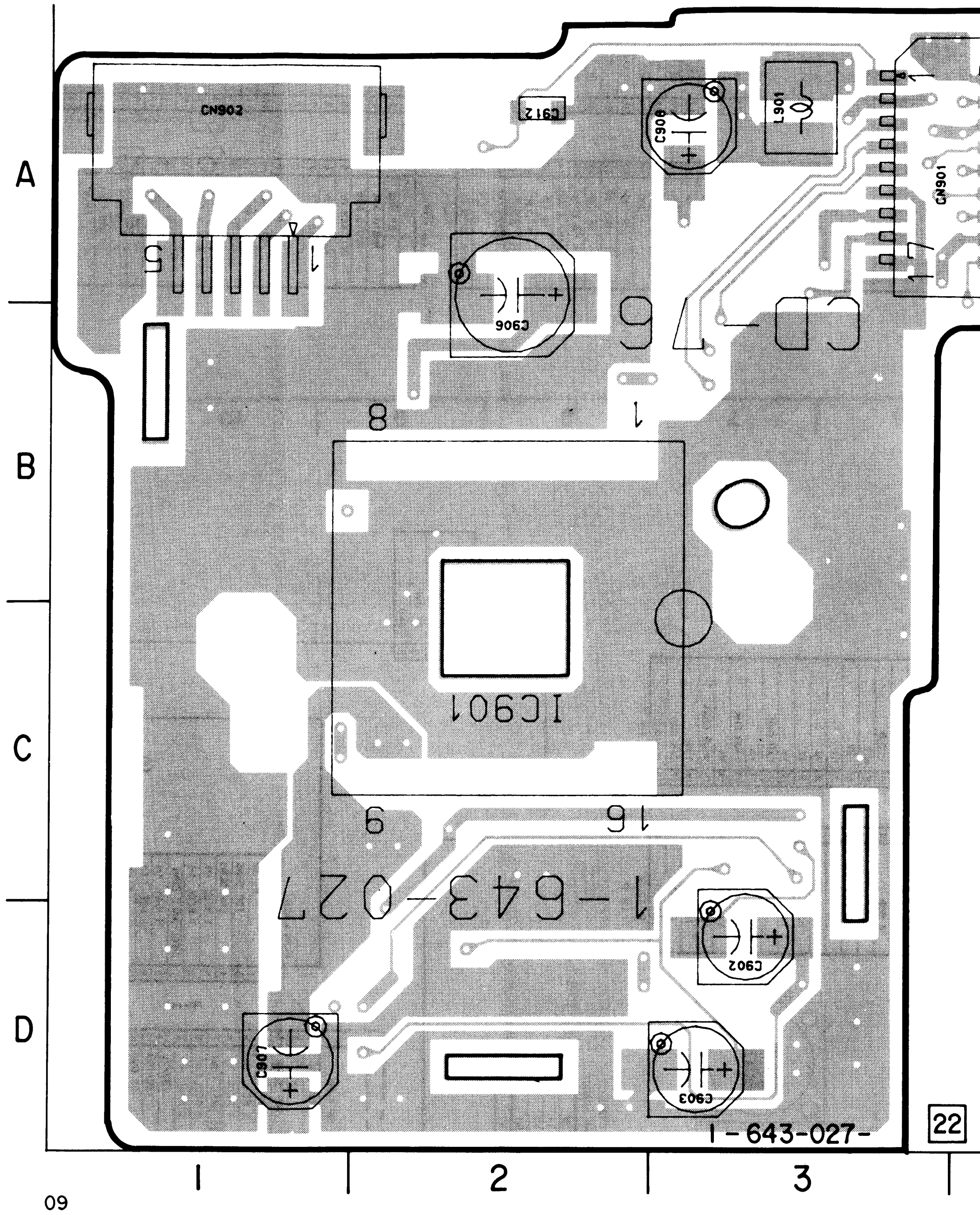
0MΩ).*

al production

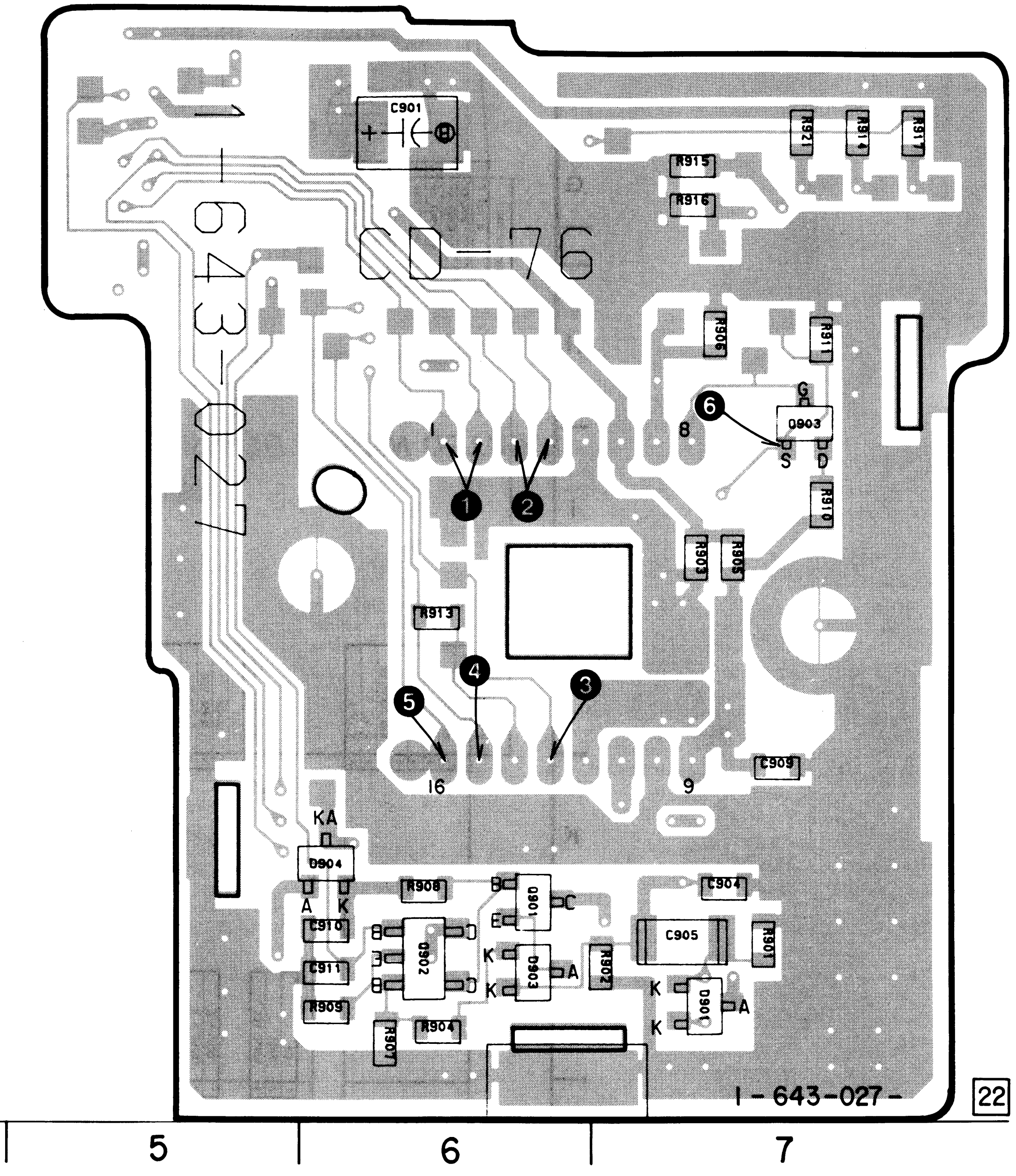
CD-76 (CCD DRIVE) PRINTED WIRING BOARD

— Ref. No. CD-76 BOARD: 1000 series —

CD-76 BOARD (COMPONENT SIDE)


CN902
C912
C906
L901
CN901
C903
IC901
C902
C907
C903
1-643-027
22
A
B
C
D
1
2
3
09

CD-76 BOARD (CONDUCTOR SIDE)


C901
1-643-027
CD-76
R921
R914
R917
R915
R916
R906
R911
Q903
G
S
D
R910
R903
R905
R913
C909
D904
KA
A
K
R908
Q901
B
E
C
C904
C905
C910
C911
R909
Q902
D903
K
R902
R901
D901
R904
R907
1
2
3
4
5
6
8
9
16
22
4
5
6
7

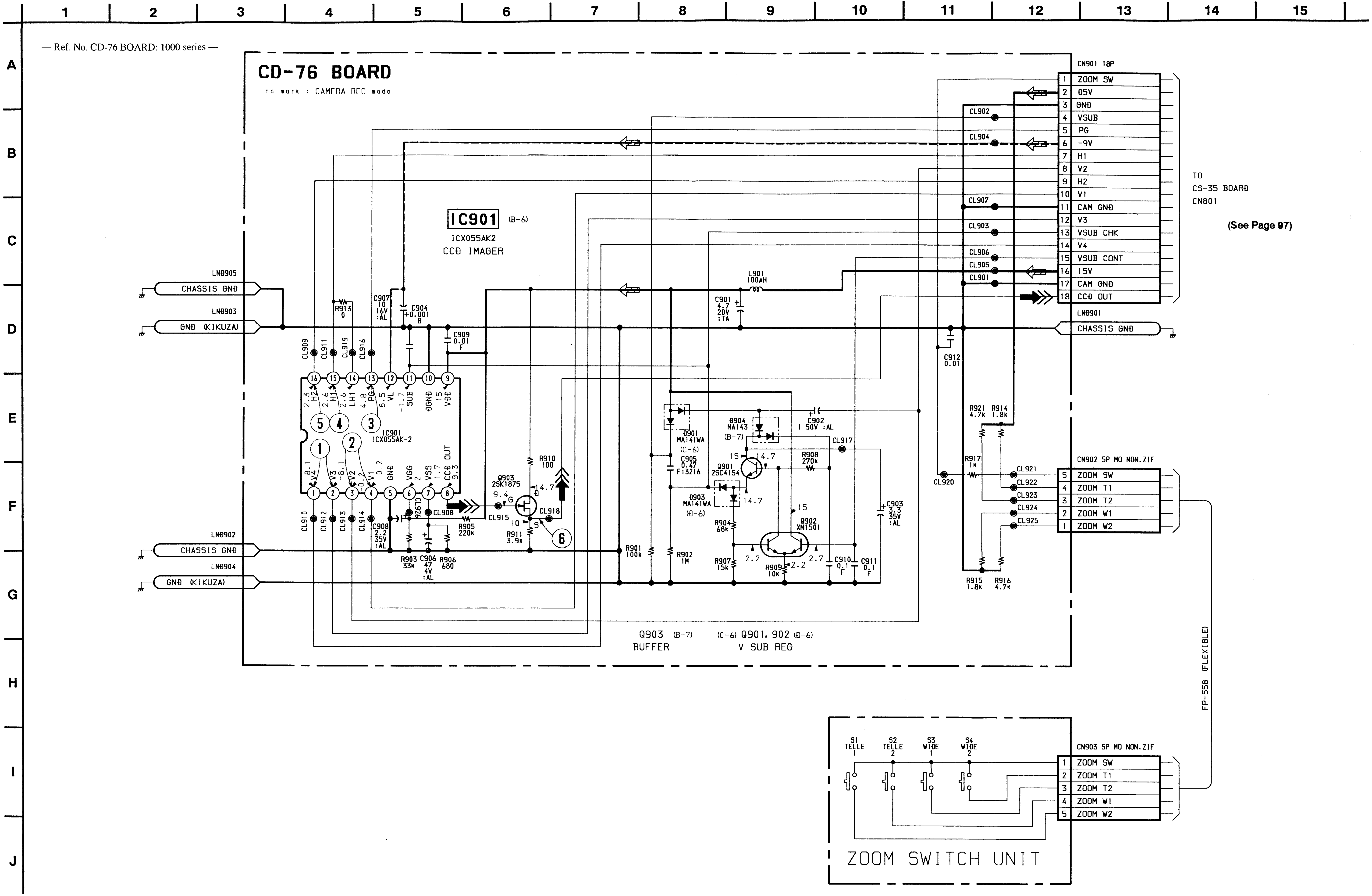
(DIODE)

D901	8-719-820-05	DIODE	1SS181
D903	8-719-820-05	DIODE	1SS181
D904	8-719-800-76	DIODE	1SS226

(TRANSISTOR)

Q901	8-729-602-21	TRANSISTOR	2SC4154-F
Q902	8-729-402-13	TRANSISTOR	XN1501
Q903	8-729-232-86	TRANSISTOR	2SK1875

CD-76 (CCD DRIVE) SCHEMATIC DIAGRAM



— Ref. No. CD-76 BOARD: 1000 series —

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7
8
9
10
11
12
13
14
15
A
B
C
D
E
F
G
H
I
J
CD-76 BOARD
no mark : CAMERA REC mode
IC901 (B-6)
ICX055AK2
CCD IMAGER
LND905
CHASSIS GND
LND903
GND (KIKUZA)
LND902
CHASSIS GND
LND904
GND (KIKUZA)
R913 0
C907 10 16V :AL
C904 0.001 B
C909 0.01 F
CL909
CL911
CL919
CL916
2.3 H2
2.6 H1
2.6 LH1
4.8 PG
-8.5 VL
-1.7 SUB
DGND
15 VDD
5
4
3
IC901
ICX055AK-2
1
2
-8.1 V4
V3 -8.1
V2 -0.2
V1 -0.2
GND
VGG 2
VSS 1.7
CCD OUT 9.3
CL910
CL912
CL913
CL914
C908 2.2 35V :AL
CL926
CL908
R903 33k
C906 47 4V :AL
R906 680
R905 220k
Q903 2SK1875
9.4
G
D
S
14.7
10
CL915
R910 100
CL918
6
R911 3.9k
R901 100k
R902 1M
D901 MA141WA (C-6)
C905 0.47 F:3216
D904 MA143 (B-7)
C902 1 50V :AL
CL917
Q901 2SC4154
15
14.7
R908 270k
D903 MA141WA (D-6)
R904 68k
R907 15k
Q902 XN1501
2.2
2.7
R909 10k
C910 0.1 F
C911 0.1 F
C903 3.3 35V :AL
L901 100µH
C901 4.7 20V :TA
Q903 (B-7)
BUFFER
(C-6) Q901, 902 (D-6)
V SUB REG
CN901 18P
1 ZOOM SW
2 D5V
3 GND
4 VSUB
5 PG
6 -9V
7 H1
8 V2
9 H2
10 V1
11 CAM GND
12 V3
13 VSUB CHK
14 V4
15 VSUB CONT
16 15V
17 CAM GND
18 CCD OUT
CL902
CL904
CL907
CL903
CL906
CL905
CL901
TO
CS-35 BOARD
CN801
(See Page 97)
LND901
CHASSIS GND
C912 0.01
R921 4.7k
R914 1.8k
R917 1k
CL920
CL921
CL922
CL923
CL924
CL925
R915 1.8k
R916 4.7k
CN902 5P MO NON.ZIF
5 ZOOM SW
4 ZOOM T1
3 ZOOM T2
2 ZOOM W1
1 ZOOM W2
FP-558 (FLEXIBLE)
S1 TELLE 1
S2 TELLE 2
S3 WIDE 1
S4 WIDE 2
CN903 5P MO NON.ZIF
1 ZOOM SW
2 ZOOM T1
3 ZOOM T2
4 ZOOM W1
5 ZOOM W2
ZOOM SWITCH UNIT

Note on the CC

- Some of this
imager (IC90
The correctio
of the camera
also written
(upper) of the
The correctio
supplied for
imager to wh
data label and
the camera m
for input meth
- The CCD im
CD-76 board
When replaci
from the old b
- Perform all a
imager has be
- Handle the C
may be broke
Also, prevent
and strong lig

- **SIGNAL PATH**

	CHROM
REC	
PB	

ge 97)

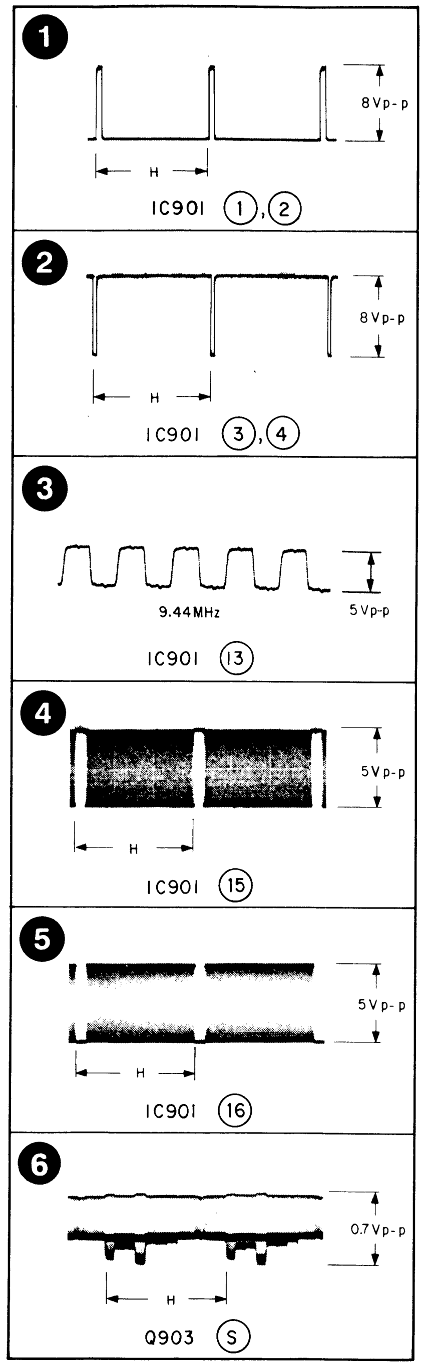
Note on the CCD Imager replacement

- Some of this units require the correction data by the CCD imager (IC901 on CD-76 board), some do not.
  The correction data is input in F page and addresses 1D to 2C of the camera micro processor (IC709 on CS-35 board), and also written on the CCD data label put on the shield case (upper) of the PS-300 board.
  The correction data is not required for the CCD imager supplied for repair. Therefore, when replacing the CCD imager to which the CCD data label is put, remove the CCD data label and input 00 to F page and addresses 1D to 2C of the camera micro processor. Refer to the camera adjustment for input method.
- The CCD imager is not mounted for the already mounted CD-76 board supplied as the repair parts.
  When replacing the CD-76 board, remove the CCD imager from the old board and install on the new board.
- Perform all adjustments of the camera block when the CCD imager has been replaced.
- Handle the CCD imager with attention such as MOS IC as it may be broken by static electricity in the structure.
  Also, prevent the receiving light section from dust attached and strong light.

- **SIGNAL PATH**

	VIDEO SIGNAL			AUDIO SIGNAL
	CHROMA	Y	Y/CHROMA	
REC			➡	
PB				

CD-76 BOARD



92

CS-35 (CAMERA, REC/PB AMP, SERVO/SYSTEM CONTROL), FP-488 (INNER FOCUS LENS) PRINTED WIRING BOARDS

— Ref. No. CS-35 BOARD: 1000 series —

(DIODE)

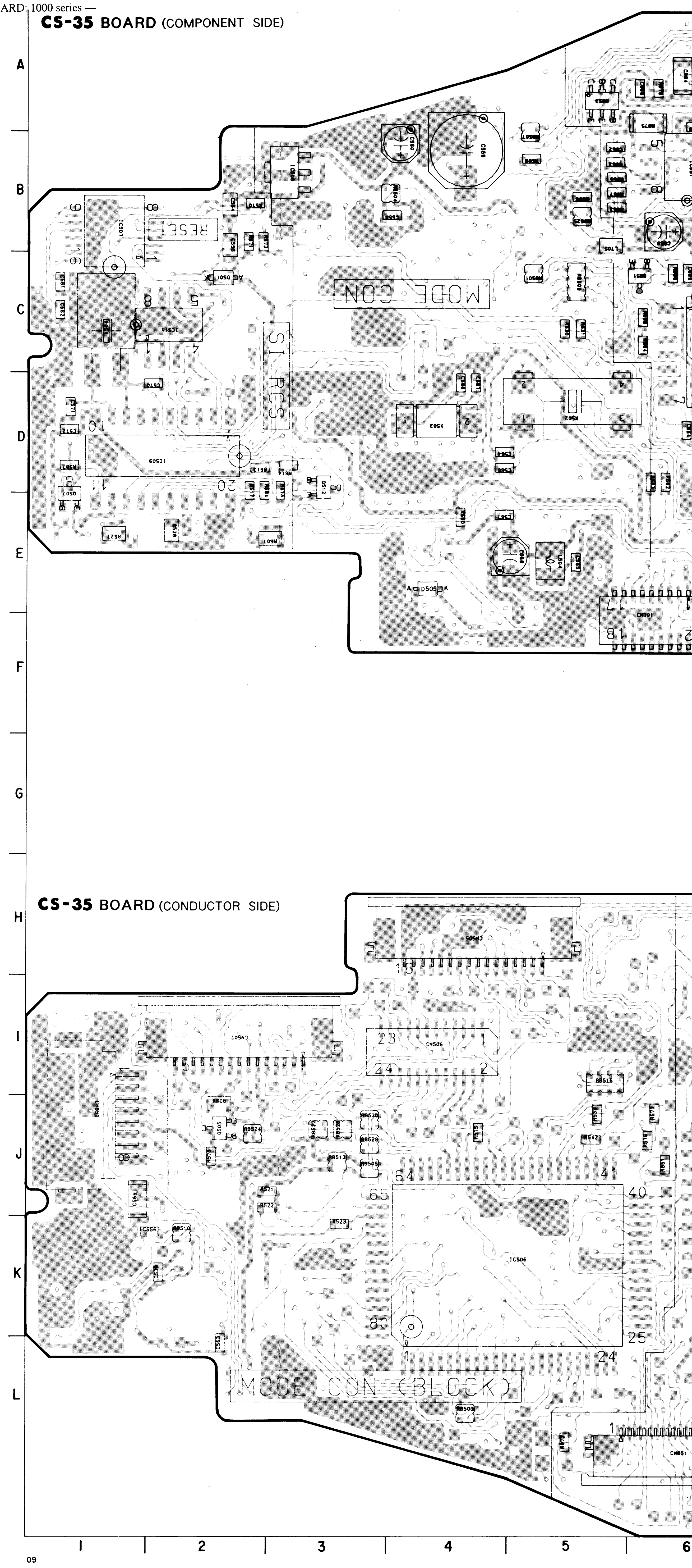
⚠D501	8-719-421-27	DIODE	MA728
D503	8-719-420-14	DIODE	MA8082-M
D504	8-719-404-35	DIODE	MA141WK
D507	8-719-404-46	DIODE	MA110

(IC)

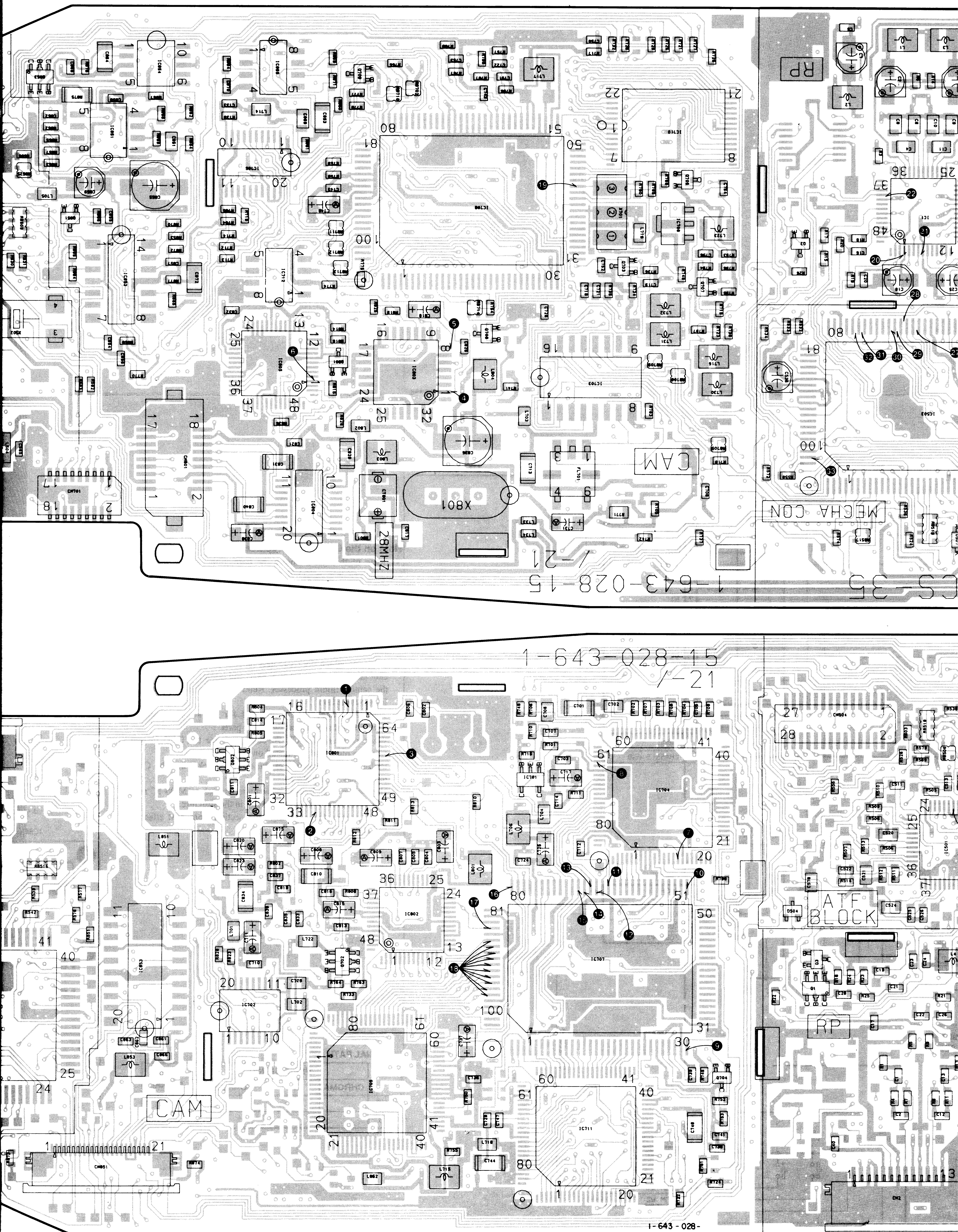
IC001	8-752-033-38	IC	CXA1202R
IC501	8-759-058-96	IC	TB1206F
IC502	8-759-999-02	IC	TL1596CDB
IC503	8-752-838-46	IC	CXP80624-410Q
IC505	8-759-990-55	IC	CXA8006M
IC506	8-759-083-36	IC	uPD75316GF-277-3B9
IC507	8-759-511-22	IC	CXA1448N
IC508	8-759-512-69	IC	S-81350HG-KD
IC509	8-759-145-63	IC	uPD7564G-540
IC510	8-759-039-01	IC	MPC1720M
IC511	8-759-044-78	IC	AK6420F
IC701	8-759-031-58	IC	SC7SU04F
IC702	8-759-635-27	IC	M62352GP
IC703	8-759-069-29	IC	uPD6456GS-618
IC704	8-752-348-92	IC	CXD2101AR
IC705	8-759-069-18	IC	CXD2103AR-T6
IC706	8-752-337-36	IC	CXD2104N
IC707	8-752-344-53	IC	CXD2100Q
IC709	8-752-837-59	IC	CXP80624-299Q
IC710	8-759-519-14	IC	MB8464-15LLPFTN
IC711	8-759-518-81	IC	CXD2112R
IC712	8-759-044-78	IC	AK6420F
IC801	8-752-350-84	IC	CXD1257AR-T5
IC802	8-752-056-39	IC	CXA1507BR
IC803	8-752-053-26	IC	CXA1399Q
IC804	8-752-327-48	IC	CXD1250N
IC805	8-752-054-61	IC	CXA1390AR
IC851	8-759-701-24	IC	NJM3414M-TE1
IC852	8-759-998-96	IC	LM324D
IC853	8-759-038-81	IC	MPC1724M
IC854	8-759-823-51	IC	LB1830M
IC855	8-759-998-98	IC	LM358D

(TRANSISTOR)

Q001	8-729-420-20	TRANSISTOR	XN4312
Q002	8-729-010-75	TRANSISTOR	MSC4116-B/C
Q003	8-729-905-12	TRANSISTOR	DTA144EU
Q041	8-729-010-60	TRANSISTOR	MSA1586-BC
Q043	8-729-216-22	TRANSISTOR	2SA1162-G
Q501	8-729-907-00	TRANSISTOR	DTC114EU
Q502	8-729-402-78	TRANSISTOR	XN6401
Q503	8-729-010-75	TRANSISTOR	MSC4116-B/C
Q505	8-729-010-60	TRANSISTOR	MSA1586-BC
Q507	8-729-905-12	TRANSISTOR	DTA144EU
Q509	8-729-822-84	TRANSISTOR	2SB1202FAST
Q510	8-729-402-81	TRANSISTOR	XN4501
Q511	8-729-402-81	TRANSISTOR	XN4501
Q512	8-729-010-75	TRANSISTOR	MSC4116-B/C
Q702	8-729-402-84	TRANSISTOR	XN4601
Q703	8-729-010-60	TRANSISTOR	MSA1586-BC
Q704	8-729-010-60	TRANSISTOR	MSA1586-BC
Q705	8-729-905-18	TRANSISTOR	DTC144EU
Q707	8-729-010-75	TRANSISTOR	MSC4116-B/C
Q708	8-729-920-XX	TRANSISTOR	DTA114EUT106
Q709	8-729-905-61	TRANSISTOR	DTC124EU
Q801	8-729-423-55	TRANSISTOR	2SC3931-D
Q802	8-729-403-27	TRANSISTOR	XN4401
Q851	8-729-010-75	TRANSISTOR	MSC4116-B/C
Q853	8-729-403-27	TRANSISTOR	XN4401


CS-35 BOARD (COMPONENT SIDE)

CS-35 BOARD (CONDUCTOR SIDE)


RP
CAM
MECHA CON
X801
28MHZ
1-643-028-15
/-21
IC701
IC702
IC704
IC707
IC708
IC711
IC801
IC802
IC803
IC805
IC853
IC503
IC501
CN801
CN701
CN851
CN504
CN2
ATF BLOCK
1-643-028-
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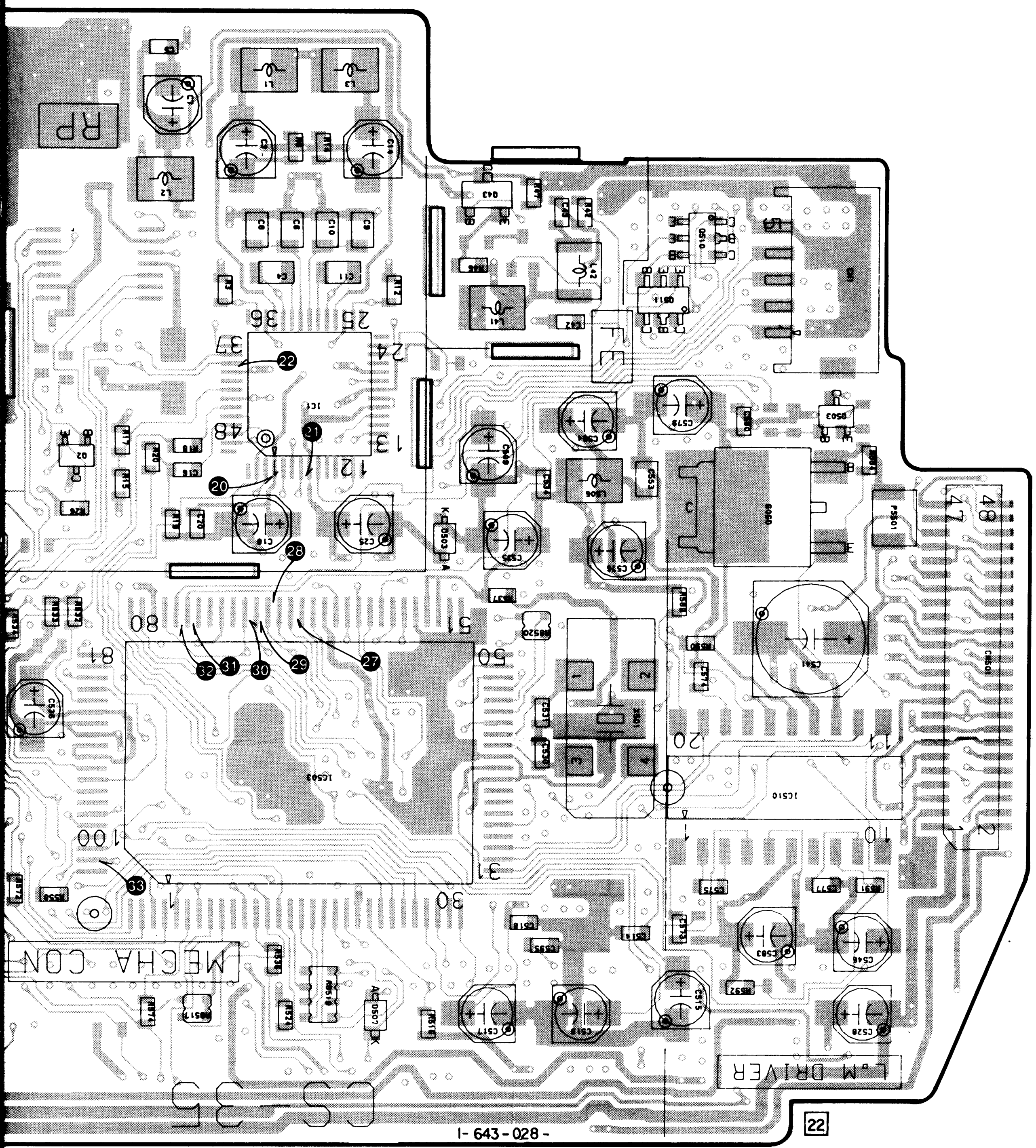
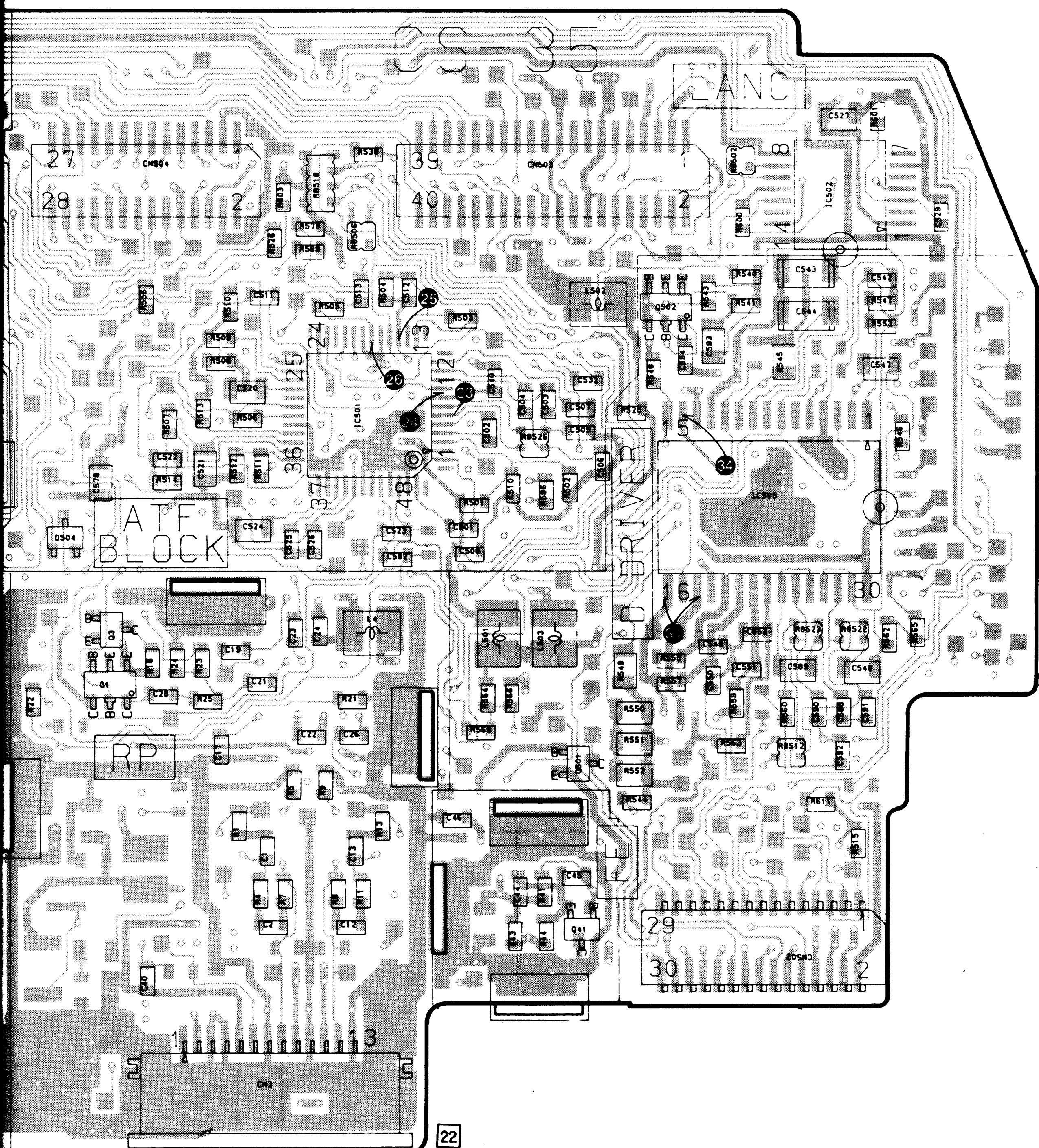
14


RP
FE
MECHA CON
L.M DRIVER
CS-35
1-643-028-
22


CS-35
LANC
ATF BLOCK
D DRIVER
FE
RP
22
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14
15
16
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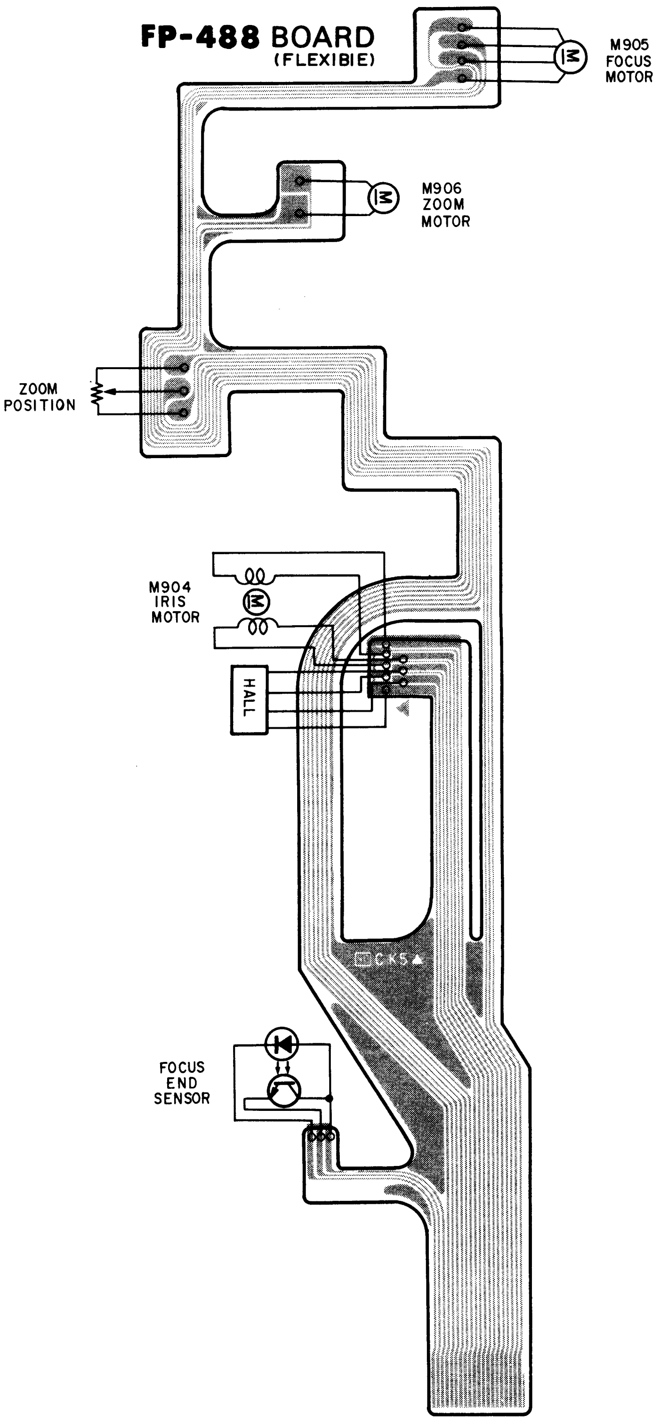
18

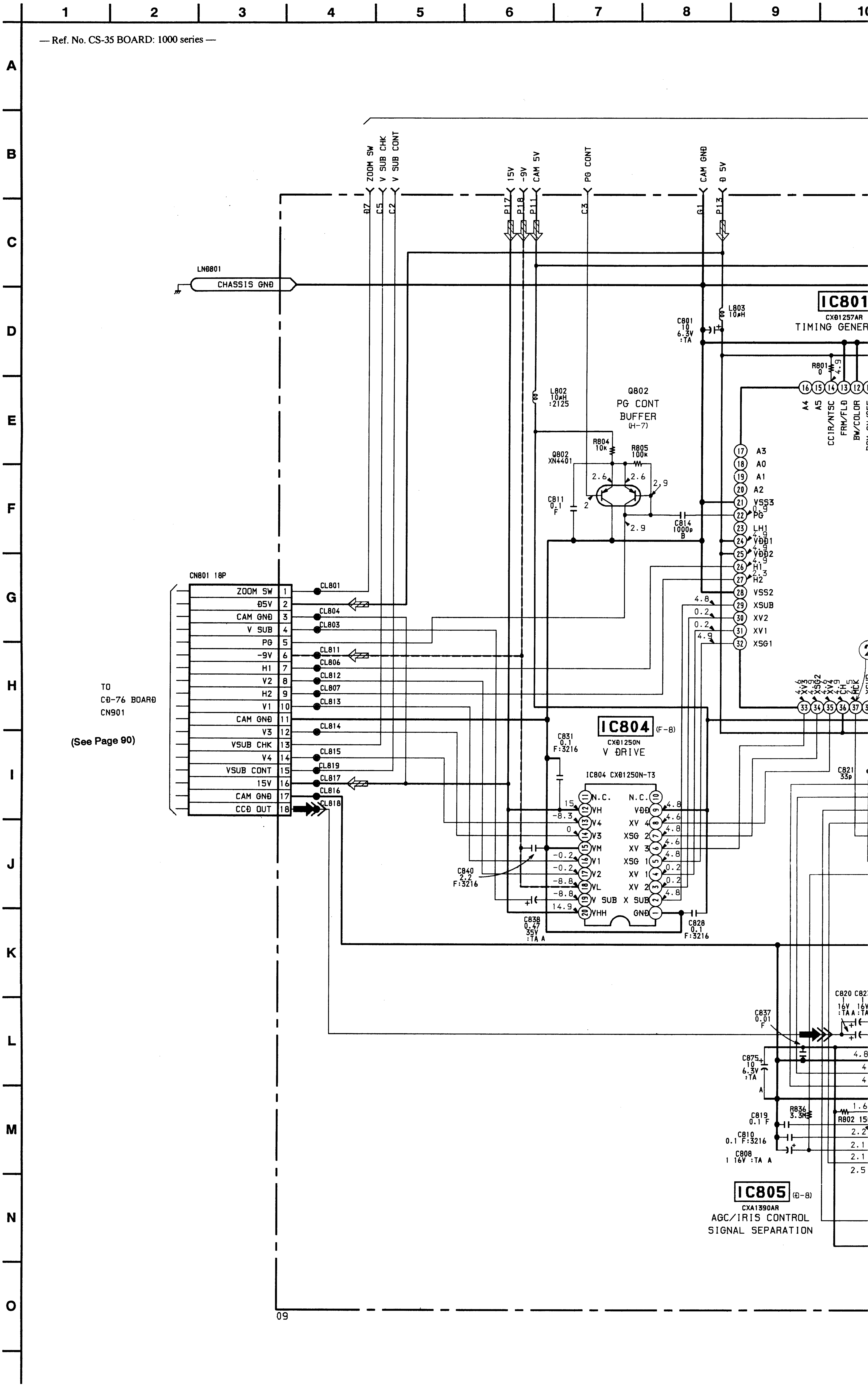
FP-488 BOARD
(FLEXIBIE)


M905
FOCUS
MOTOR
M906
ZOOM
MOTOR
ZOOM
POSITION
M904
IRIS
MOTOR
HALL
CK5
FOCUS
END
SENSOR
1
21

CS-35 (CAMERA) SCHEMATIC DIAGRAM

- Refer to page 93 for Printed Wiring Board.

— Ref. No. CS-35 BOARD: 1000 series —



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A
B
C
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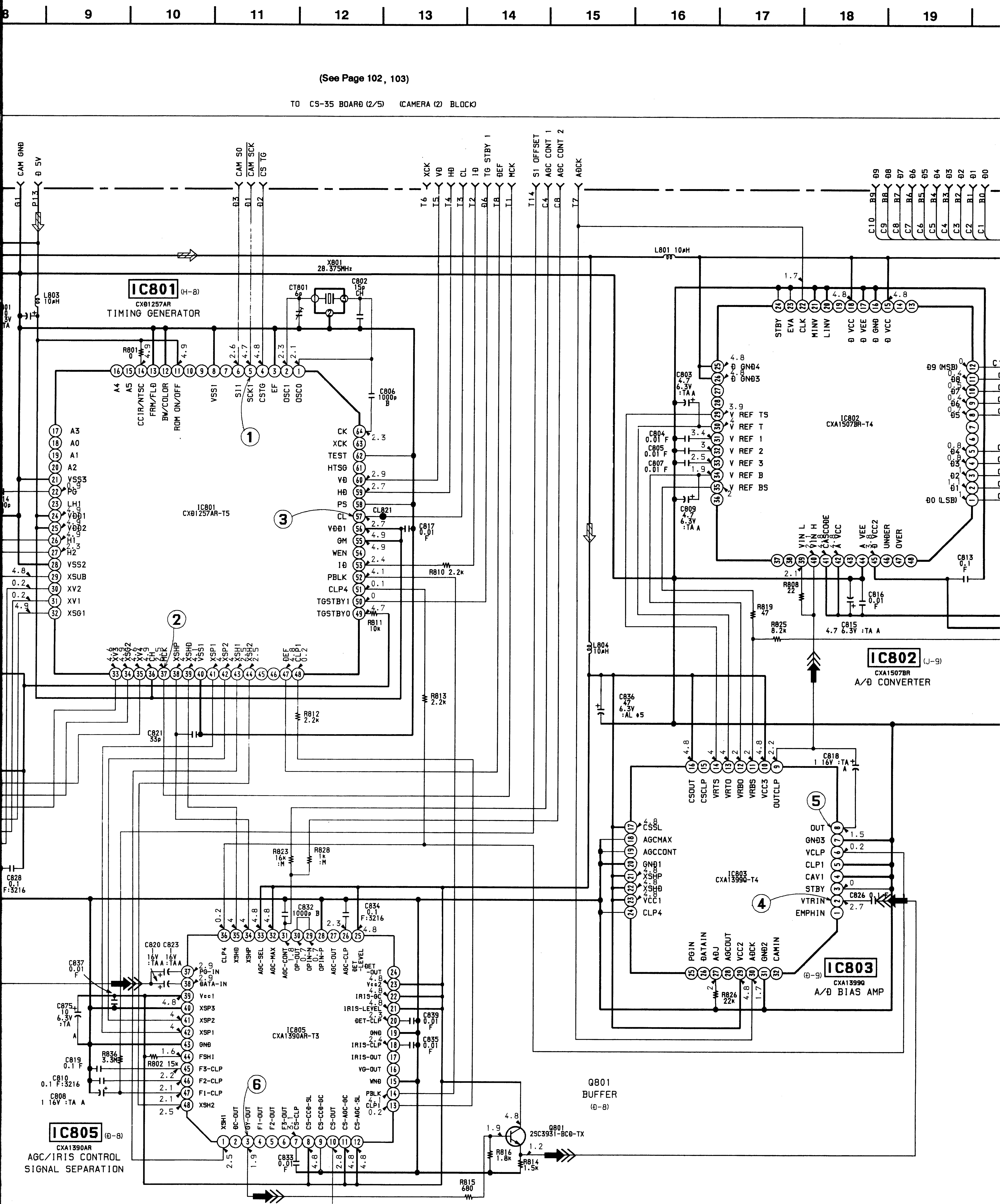
H
I
J
K
L
M
N
O
ZOOM SW
V SUB CHK
V SUB CONT
Ø7
C5
C2
15V
-9V
CAM 5V
P17
P18
P11
PG CONT
C3
CAM GND
D 5V
G1
P13
LND801
CHASSIS GND
IC801
CXD1257AR
TIMING GENER
L803
10μH
C801
10
6.3V
:TA
R801
0
A4
A5
CCIR/NTSC
FRM/FLD
BW/COLOR
L802
10μH
:2125
Q802
PG CONT
BUFFER
(H-7)
Q802
XN4401
R804
10k
R805
100k
C811
0.1
F
C814
1000p
B
A3
A0
A1
A2
VSS3
PG
LH1
VDD1
VDD2
H1
H2
VSS2
XSUB
XV2
XV1
XSG1
CN801 18P
ZOOM SW
D5V
CAM GND
V SUB
PG
-9V
H1
V2
H2
V1
CAM GND
V3
VSUB CHK
V4
VSUB CONT
15V
CAM GND
CCD OUT
CL801
CL804
CL803
CL811
CL806
CL812
CL807
CL813
CL814
CL815
CL819
CL817
CL816
CL818
TO
CD-76 BOARD
CN901
(See Page 90)
IC804
(F-8)
CXD1250N
V DRIVE
IC804 CXD1250N-T3
C831
0.1
F:3216
N.C.
VH
V4
V3
VM
V1
V2
VL
V SUB
VHH
N.C.
VDD
XV 4
XSG 2
XV 3
XSG 1
XV 1
XV 2
X SUB
GND
C840
2.2
F:3216
C838
0.47
35V
:TA A
C828
0.1
F:3216
C821
33p
C820
C822
16V
:TA A
C837
0.01
F
C875
10
6.3V
:TA
A
R836
3.3M
R802
C819
0.1 F
C810
0.1 F:3216
C808
1 16V :TA A
IC805
(D-8)
CXA1390AR
AGC/IRIS CONTROL
SIGNAL SEPARATION
09


8
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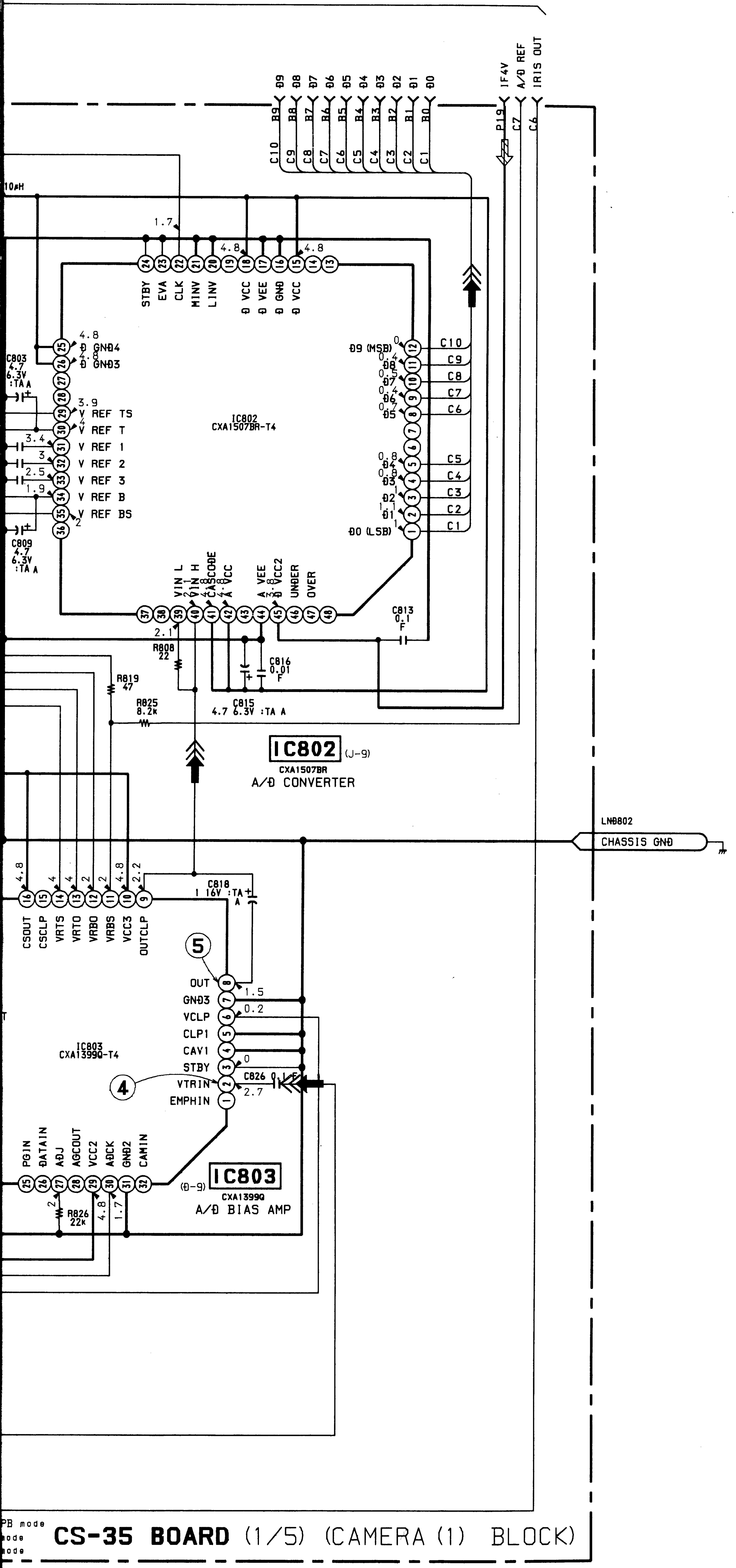
19
(See Page 102, 103)
TO CS-35 BOARD (2/5) (CAMERA (2) BLOCK)
CAM GND
D 5V
CAM SO
CAM SCK
CS TG
XCK
VD
HD
CL
ID
TG STBY 1
DEF
MCK
S1 OFFSET
AGC CONT 1
AGC CONT 2
ADCK
D9
D8
D7
D6
D5
D4
D3
D2
D1
D0
IC801 (H-8)
CXD1257AR
TIMING GENERATOR
X801 28.375MHz
L801 10μH
L803 10μH
L804 10μH
IC802 (J-9)
CXA1507BR
A/D CONVERTER
IC803 (D-9)
CXA1399Q
A/D BIAS AMP
IC805 (D-8)
CXA1390AR
AGC/IRIS CONTROL
SIGNAL SEPARATION
Q801
BUFFER
(D-8)
Q801 2SC3931-BCD-TX
①
②
③
④
⑤
⑥

no mark : REC/PB mode
( ) : REC mode
< > : PB mode

CS-35 BOARD (1/5) (CAMERA (1

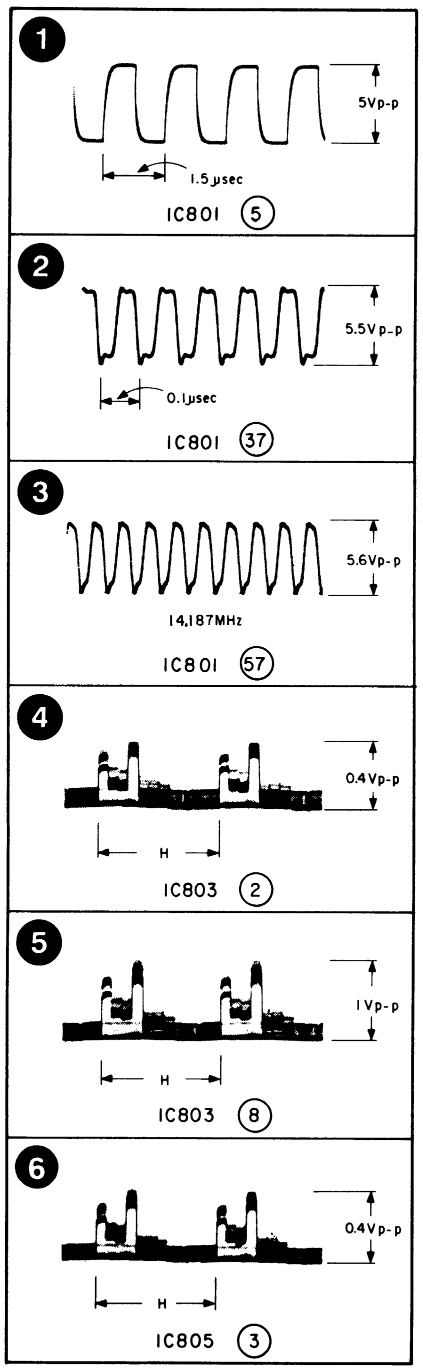

D9
D8
D7
D6
D5
D4
D3
D2
D1
D0
IF4V
A/D REF
IRIS OUT
B9 B8 B7 B6 B5 B4 B3 B2 B1 B0
C10 C9 C8 C7 C6 C5 C4 C3 C2 C1
P19
C7
C6
10μH
STBY
EVA
CLK
MINV
LINV
D VCC
D VEE
D GND
D VCC
D GND4
D GND3
D9 (MSB)
D8
D7
D6
D5
D4
D3
D2
D1
D0 (LSB)
V REF TS
V REF T
V REF 1
V REF 2
V REF 3
V REF B
V REF BS
IC802
CXA1507BR-T4
C803
4.7
6.3V
:TA A
C809
4.7
6.3V
:TA A
VIN L
VIN H
CASCODE
A VCC
A VEE
D VCC2
UNDER
OVER
C813
0.1
F
R808
22
C816
0.01
F
R819
47
R825
8.2k
C815
4.7 6.3V :TA A
IC802 (J-9)
CXA1507BR
A/D CONVERTER
LND802
CHASSIS GND
CSOUT
CSCLP
VRTS
VRTO
VRBO
VRBS
VCC3
OUTCLP
C818
1 16V :TA A
⑤
OUT
GND3
VCLP
CLP1
CAV1
STBY
VTRIN
EMPHIN
④
IC803
CXA1399Q-T4
C826 0.1 F
PGIN
DATAIN
ADJ
AGCOUT
VCC2
ADCK
GND2
CAMIN
R826
22k
IC803 (D-9)
CXA1399Q
A/D BIAS AMP
PB mode

CS-35 BOARD (1/5) (CAMERA (1) BLOCK)

- **SIGNAL PATH**

	VIDEO SIGNAL			AUDIO SIGNAL
	CHROMA	Y	Y/CHROMA	
REC	➡	⇛	⇛⋙	
PB				

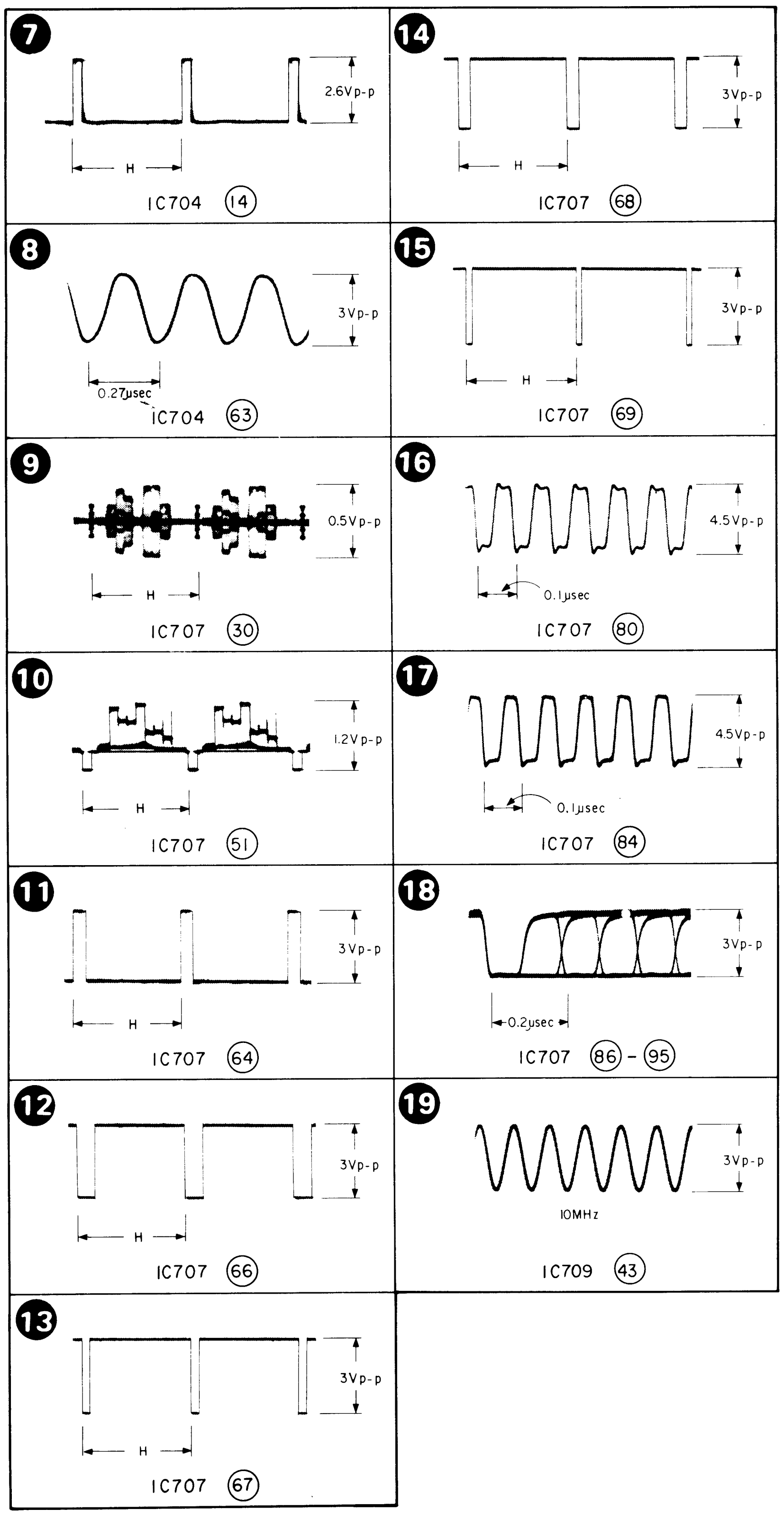
CS-35 BOARD (1/5)



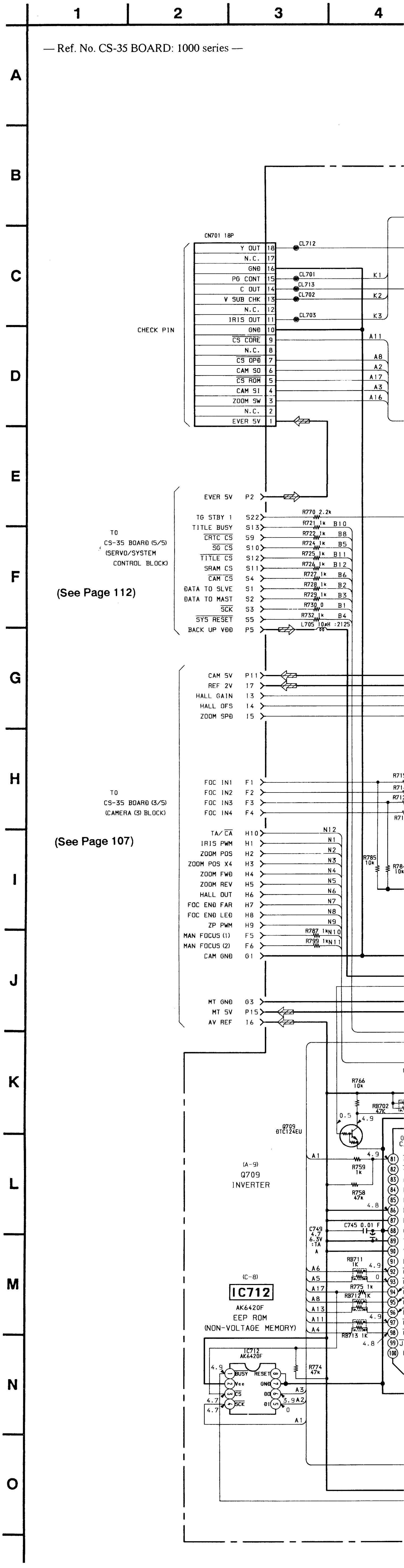
- **SIGNAL PATH**

	VIDEO SIGNAL			AUDIO SIGNAL
	CHROMA	Y	Y/CHROMA	
REC	➡	➡›	➡››	
PB				

CS-35 BOARD (2/5)



CS-35 (CAMERA) SCHEMATIC DIAGRAM • Refer to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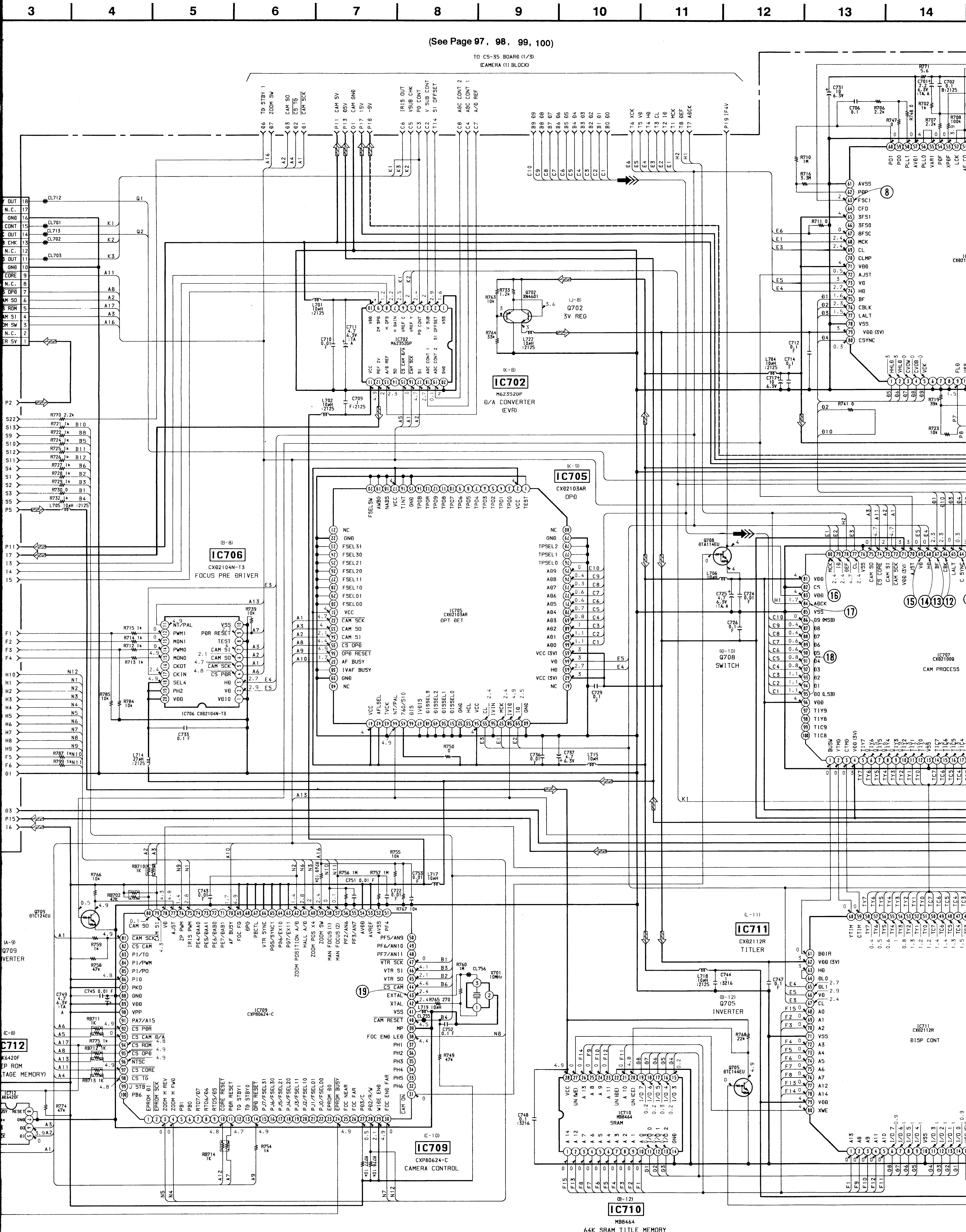
— Ref. No. CS-35 BOARD: 1000 series —
CN701 18P
Y OUT 18
N.C. 17
GND 16
PG CONT 15
C OUT 14
V SUB CHK 13
N.C. 12
IRIS OUT 11
GND 10
CS CORE 9
N.C. 8
CS OPD 7
CAM SO 6
CS ROM 5
CAM SI 4
ZOOM SW 3
N.C. 2
EVER 5V 1
CHECK PIN
CL712
CL701
CL713
CL702
CL703
K1
K2
K3
A11
A8
A2
A17
A3
A16
EVER 5V P2
TG STBY 1 S22
TITLE BUSY S13
CRTC CS S9
SG CS S10
TITLE CS S12
SRAM CS S11
CAM CS S4
DATA TO SLVE S1
DATA TO MAST S2
SCK S3
SYS RESET S5
BACK UP VDD P5
TO CS-35 BOARD (5/5) (SERVO/SYSTEM CONTROL BLOCK)
(See Page 112)
R770 2.2k
R721 1k B10
R722 1k B8
R724 1k B5
R725 1k B11
R726 1k B12
R727 1k B6
R728 1k B2
R729 1k B3
R730 0 B1
R732 1k B4
L705 10μH
CAM 5V P11
REF 2V I7
HALL GAIN I3
HALL OFS I4
ZOOM SPD I5
FOC IN1 F1
FOC IN2 F2
FOC IN3 F3
FOC IN4 F4
TO CS-35 BOARD (3/5) (CAMERA (3) BLOCK)
(See Page 107)
TA/CA H10
IRIS PWM H1
ZOOM POS H2
ZOOM POS X4 H3
ZOOM FWD H4
ZOOM REV H5
HALL OUT H6
FOC END FAR H7
FOC END LED H8
ZP PWM H9
MAN FOCUS (1) F5
MAN FOCUS (2) F6
CAM GND G1
MT GND G3
MT 5V P15
AV REF I6
N12
N1
N2
N3
N4
N5
N6
N7
N8
N9
R787 1k N10
R799 1k N11
R785 10k
R766 10k
RB702 47k
Q709 DTC124EU
(A-9) Q709 INVERTER
R759 1k
R758 47k
C745 0.01 F
C749 4.7 6.3V TA
RB711 1k
R775 1k
RB712 1k
RB713 1k
R774 47k
A1
A6
A5
A17
A8
A13
A11
A4
A3
A2
(C-8)
IC712
AK6420F
EEP ROM (NON-VOLTAGE MEMORY)
IC712 AK6420F
BUSY
RESET
Vcc
GND
CS
DO
SCK
DI
0.5
4.9
4.8
4.7
3.9
0

• Refer to page 93 for Printed Wiring Board.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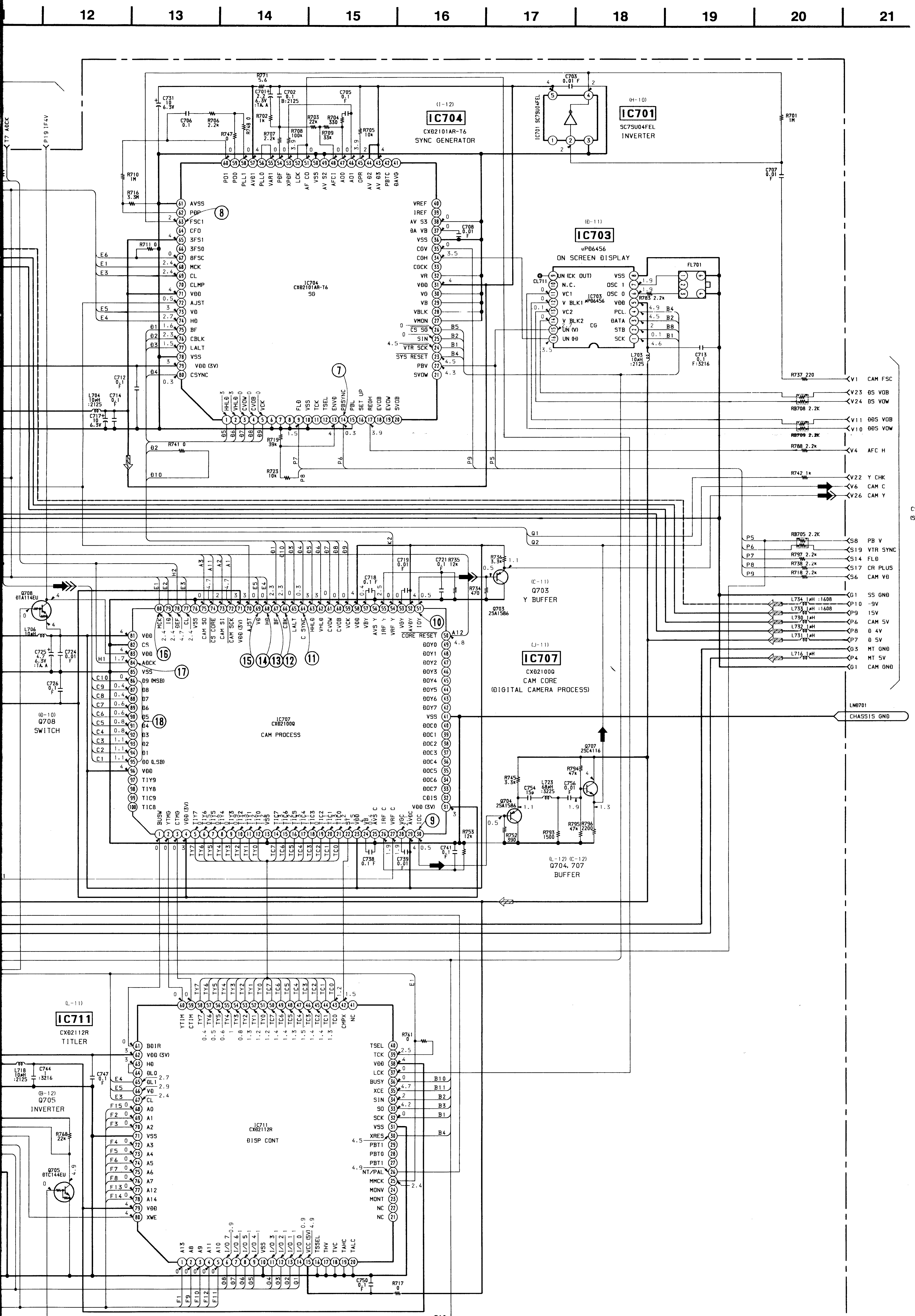
(See Page 97, 98, 99, 100)
TO CS-35 BOARD (1/3)
(CAMERA (1) BLOCK)
(K-8)
IC702
M62352GP
D/A CONVERTER
(EVR)
(J-8)
Q702
3V REG
(K-9)
IC705
CXD2103AR
OPD
(B-8)
IC706
CXD2104N-T3
FOCUS PRE DRIVER
(B-10)
Q708
SWITCH
IC707
CXD2100Q
CAM PROCESS
(L-11)
IC711
CXD2112R
TITLER
(B-12)
Q705
INVERTER
IC711
CXD2112R
DISP CONT
(C-10)
IC709
CXP80624-C
CAMERA CONTROL
(B-12)
IC710
MB8464
64K SRAM TITLE MEMORY
(A-9)
Q709
INVERTER
(C-8)
IC712
AK6420F
EEP ROM
(VOLTAGE MEMORY)


12
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21
IC704
CX02101AR-T6
SYNC GENERATOR
IC701
SC7SU04FEL
INVERTER
IC703
uPD6456
ON SCREEN DISPLAY
FL701
IC707
CX02100Q
CAM CORE
(DIGITAL CAMERA PROCESS)
Q703
2SA1586
Y BUFFER
Q704, 707
BUFFER
Q708
DTA114EU
SWITCH
IC711
CX02112R
TITLER
Q705
DTC144EU
INVERTER
V1 CAM FSC
V23 DS VDB
V24 DS VDW
V11 DDS VDB
V10 DDS VDW
V4 AFC H
V22 Y CHK
V6 CAM C
V26 CAM Y
S8 PB V
S19 VTR SYNC
S14 FLD
S17 CR PLUS
S6 CAM VD
G1 SS GND
P10 -9V
P9 15V
P6 CAM 5V
P8 D 4V
P7 D 5V
G3 MT GND
P4 MT 5V
G1 CAM GND
LND701
CHASSIS GND

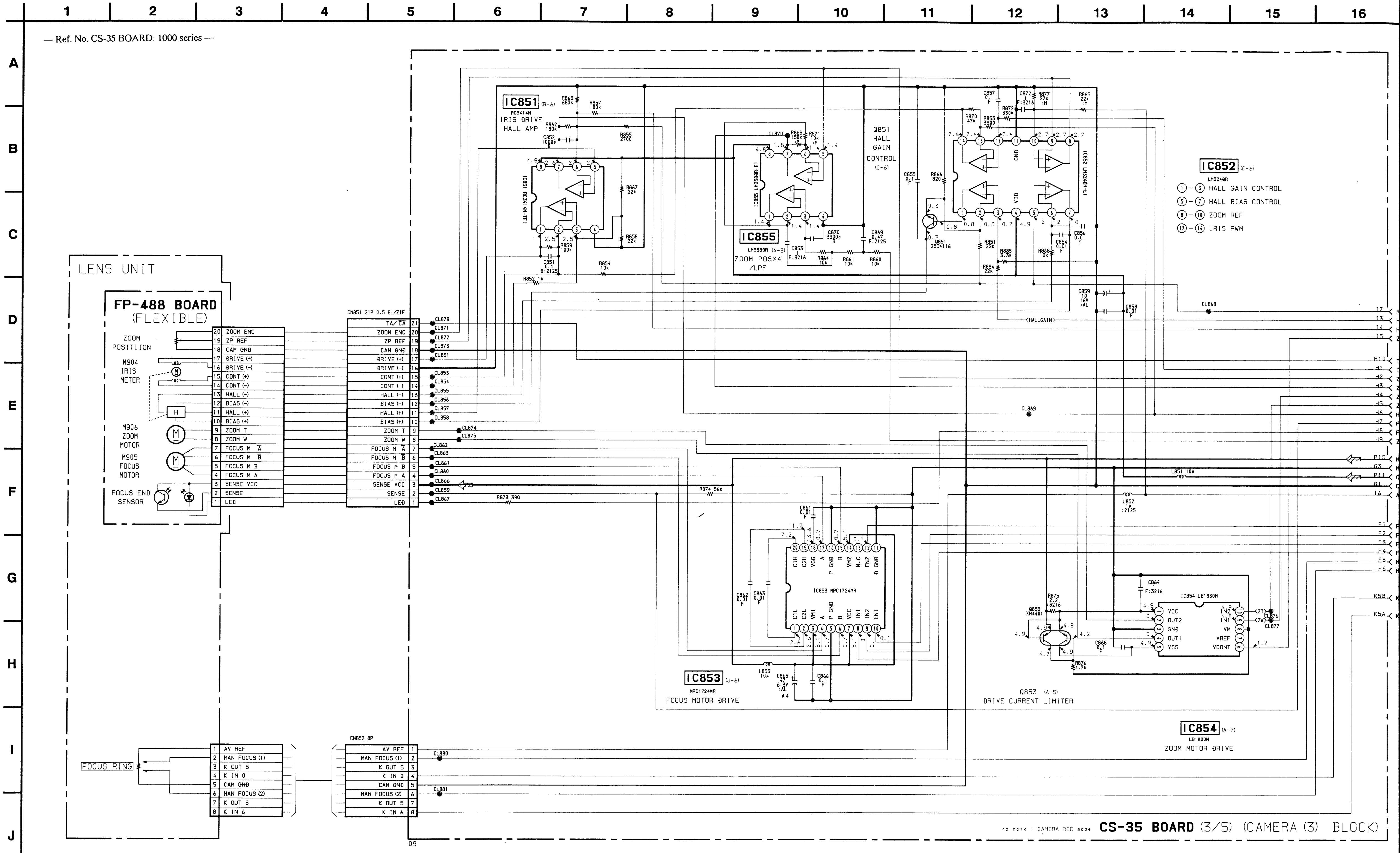
TO
CS-35 BOARD (5/5)
(SERVO/SYSTEM
CONTROL BLOCK)

(See Page 111, 112)

no mark:CAMERA REC mode

CS-35 BOARD (2/5) (CAMERA (3) BLOCK)

- Refer to page **93** for Printed Wiring Board.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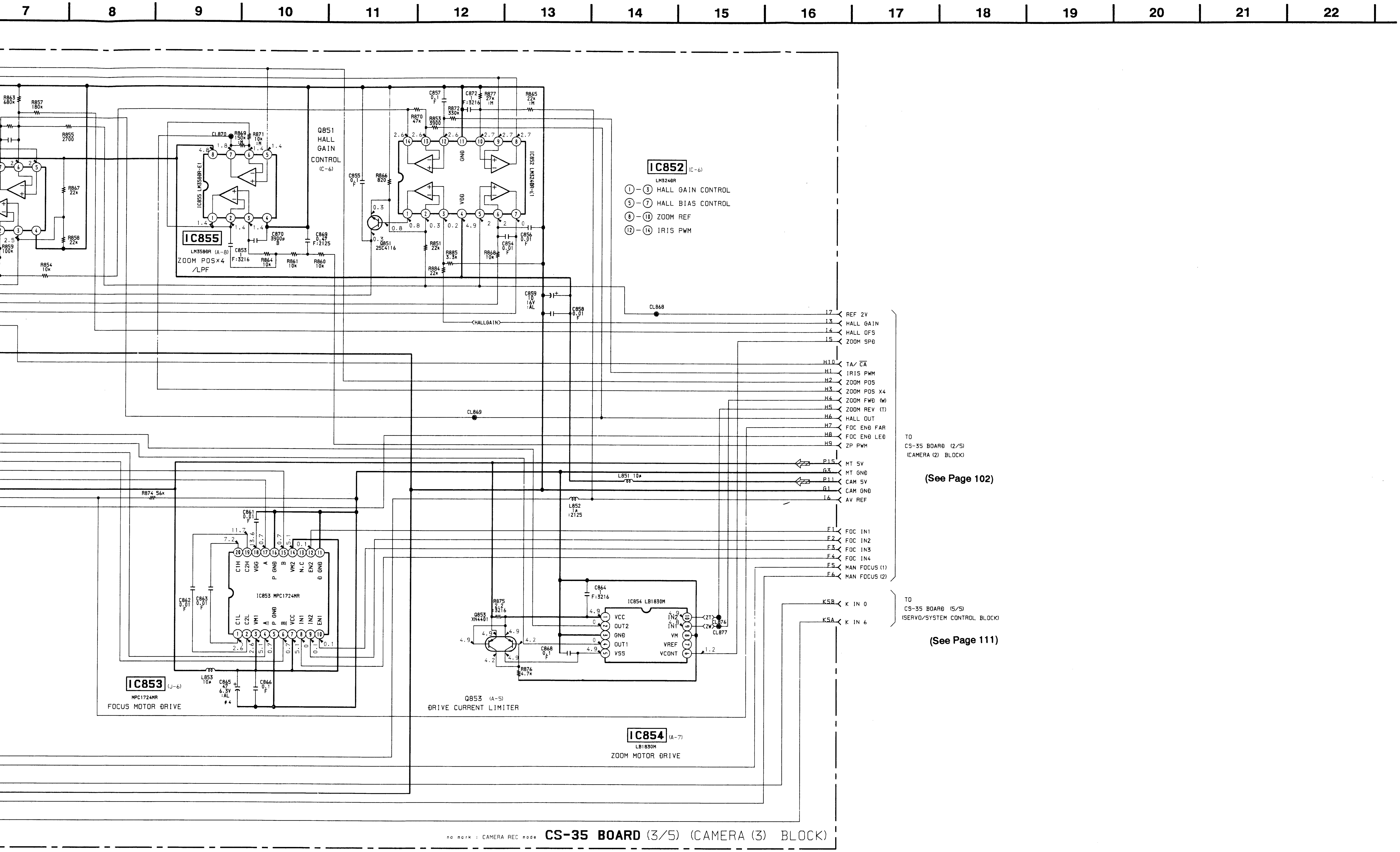
J
— Ref. No. CS-35 BOARD: 1000 series —
LENS UNIT
FP-488 BOARD
(FLEXIBLE)
ZOOM POSITIION
M904 IRIS METER
M906 ZOOM MOTOR
M905 FOCUS MOTOR
FOCUS END SENSOR
FOCUS RING
20 ZOOM ENC
19 ZP REF
18 CAM GND
17 DRIVE (+)
16 DRIVE (-)
15 CONT (+)
14 CONT (-)
13 HALL (-)
12 BIAS (-)
11 HALL (+)
10 BIAS (+)
9 ZOOM T
8 ZOOM W
7 FOCUS M A
6 FOCUS M B
5 FOCUS M B
4 FOCUS M A
3 SENSE VCC
2 SENSE
1 LED
CN851 21P 0.5 EL/ZIF
TA/CA 21
CN852 8P
1 AV REF
2 MAN FOCUS (1)
3 K OUT 5
4 K IN 0
5 CAM GND
6 MAN FOCUS (2)
7 K OUT 5
8 K IN 6
IC851 (B-6)
RC3414M
IRIS DRIVE
HALL AMP
IC855
LM358OR (A-8)
ZOOM POS×4
/LPF
Q851
HALL
GAIN
CONTROL
(C-6)
Q851 2SC4116
IC852 (C-6)
LM324OR
① — ③ HALL GAIN CONTROL
⑤ — ⑦ HALL BIAS CONTROL
⑧ — ⑩ ZOOM REF
⑫ — ⑭ IRIS PWM
<HALLGAIN>
IC853 (J-6)
MPC1724MR
FOCUS MOTOR DRIVE
IC853 MPC1724MR
C1H C2H VGG A P GND B VM2 N.C EN2 D GND
C1L C2L VM1 A P GND B VCC IN1 IN2 EN1
Q853 (A-5)
DRIVE CURRENT LIMITER
Q853 XN4401
IC854 (A-7)
LB1830M
ZOOM MOTOR DRIVE
IC854 LB1830M
VCC OUT2 GND OUT1 VSS
IN2 IN1 VM VREF VCONT
CL879 CL871 CL872 CL873 CL851 CL853 CL854 CL855 CL856 CL857 CL858 CL874 CL875 CL862 CL863 CL861 CL860 CL866 CL859 CL867 CL868 CL869 CL876 CL877 CL880 CL881
R873 390
R874 56k
L851 10μ
L852 1μ :2125
L853 10μ
C865 47 6.3V :AL
C859 10 16V :AL
C858 0.01 F
C864 F:3216
R875 2.2 :3216
R876 4.7k
C868 0.1 F
I7 I3 I4 I5 H10 H1 H2 H3 H4 H5 H6 H7 H8 H9 P15 G3 P11 G1 I6 F1 F2 F3 F4 F5 F6 K5B K5A
09
no mark : CAMERA REC mode
CS-35 BOARD (3/5) (CAMERA (3) BLOCK)

3 for Printed Wiring Board.


7
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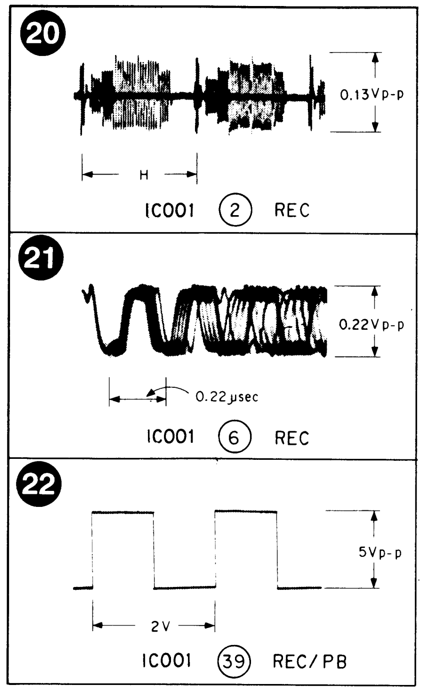
22
Q851
HALL
GAIN
CONTROL
(C-6)
IC855
LM358AR (A-8)
ZOOM POS×4
/LPF
IC852 (C-6)
LM3240R
①-③ HALL GAIN CONTROL
⑤-⑦ HALL BIAS CONTROL
⑧-⑩ ZOOM REF
⑫-⑭ IRIS PWM
IC853 MPC1724MR
IC853 (J-6)
MPC1724MR
FOCUS MOTOR DRIVE
Q853 XN4401
Q853 (A-5)
DRIVE CURRENT LIMITER
IC854 LB1830M
IC854 (A-7)
LB1830M
ZOOM MOTOR DRIVE
VCC
OUT2
GND
OUT1
VSS
IN2
IN1
VM
VREF
VCONT
CL868
CL869
CL870
CL876
CL877
<HALLGAIN>
L851 10μ
L852 1μ :2125
L853 10μ
R874 56k
I7 REF 2V
I3 HALL GAIN
I4 HALL OFS
I5 ZOOM SPD
H10 TA/CA
H1 IRIS PWM
H2 ZOOM POS
H3 ZOOM POS X4
H4 ZOOM FWD (W)
H5 ZOOM REV (T)
H6 HALL OUT
H7 FOC END FAR
H8 FOC END LED
H9 ZP PWM
P15 MT 5V
G3 MT GND
P11 CAM 5V
G1 CAM GND
I6 AV REF
F1 FOC IN1
F2 FOC IN2
F3 FOC IN3
F4 FOC IN4
F5 MAN FOCUS (1)
F6 MAN FOCUS (2)
TO
CS-35 BOARD (2/5)
(CAMERA (2) BLOCK)
(See Page 102)
K5B K IN 0
K5A K IN 6
TO
CS-35 BOARD (5/5)
(SERVO/SYSTEM CONTROL BLOCK)
(See Page 111)

no mark : CAMERA REC mode **CS-35 BOARD** (3/5) (CAMERA (3) BLOCK)

CS-35 BOARD (4/5)



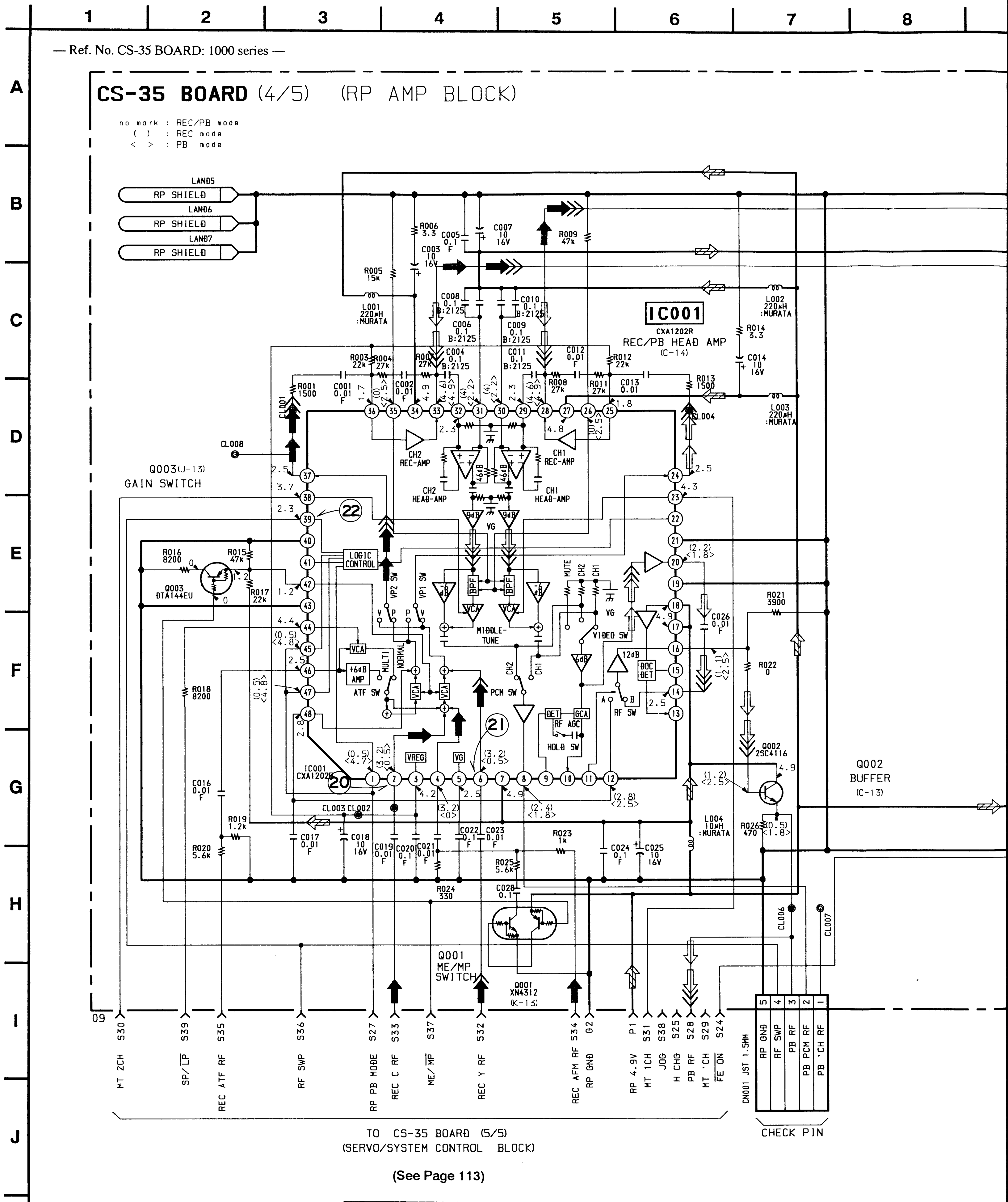
- **SIGNAL PATH**

	VIDEO SIGNAL			AUDIO SIGNAL
	CHROMA	Y	Y/CHROMA	
REC	➡	➡»	➡»»	➡
PB	⇨	⇨»	⇨»»	⇨

CS-35 (REC/PB AMP) SCHEMATIC DIAGRAM

- Refer to page 93 for Printed Wiring Board.

— Ref. No. CS-35 BOARD: 1000 series —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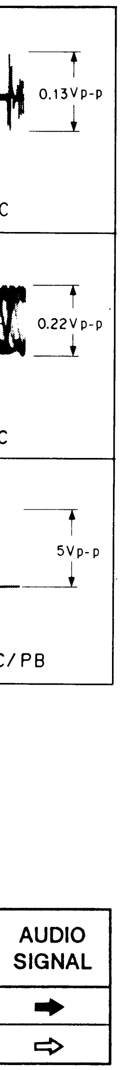
G
H
I
J
CS-35 BOARD (4/5) (RP AMP BLOCK)
no mark : REC/PB mode
( ) : REC mode
< > : PB mode
LAND5
RP SHIELD
LAND6
RP SHIELD
LAND7
RP SHIELD
IC001
CXA1202R
REC/PB HEAD AMP
(C-14)
Q003(J-13)
GAIN SWITCH
Q003
DTA144EU
R016 8200
R015 47k
R017 22k
R018 8200
R019 1.2k
R020 5.6k
C016 0.01 F
C017 0.01 F
C018 10 16V
CL008
CL003
CL002
CL001
CL004
CL006
CL007
L001 220μH :MURATA
L002 220μH :MURATA
L003 220μH :MURATA
L004 10μH :MURATA
R005 15k
R006 3.3
R009 47k
R012 22k
R013 1500
R014 3.3
R021 3900
R022 0
R023 1k
R024 330
R025 5.6k
R026 470
C014 10 16V
C026 0.01 F
CH2 REC-AMP
CH1 REC-AMP
CH2 HEAD-AMP
CH1 HEAD-AMP
LOGIC CONTROL
VP2 SW
VP1 SW
MIDDLE-TUNE
VIDEO SW
MUTE
VG
BPF
VCA
+6dB AMP
ATF SW
MULTI
NORMAL
PCM SW
DET
GCA
RF AGC
HOLD SW
RF SW
DOC DET
VREG
Q002 2SC4116
Q002 BUFFER (C-13)
Q001 ME/MP SWITCH
Q001 XN4312 (K-13)
CN001 JST 1.5MM
RP GND
RF SWP
PB RF
PB PCM RF
PB 'CH RF
CHECK PIN
MT 2CH S30
SP/LP S39
REC ATF RF S35
RF SWP S36
RP PB MODE S27
REC C RF S33
ME/MP S37
REC Y RF S32
REC AFM RF S34
RP GND G2
RP 4.9V P1
MT 1CH S31
JOG S38
H CHG S25
PB RF S28
MT 'CH S29
FE ON S24
TO CS-35 BOARD (5/5)
(SERVO/SYSTEM CONTROL BLOCK)

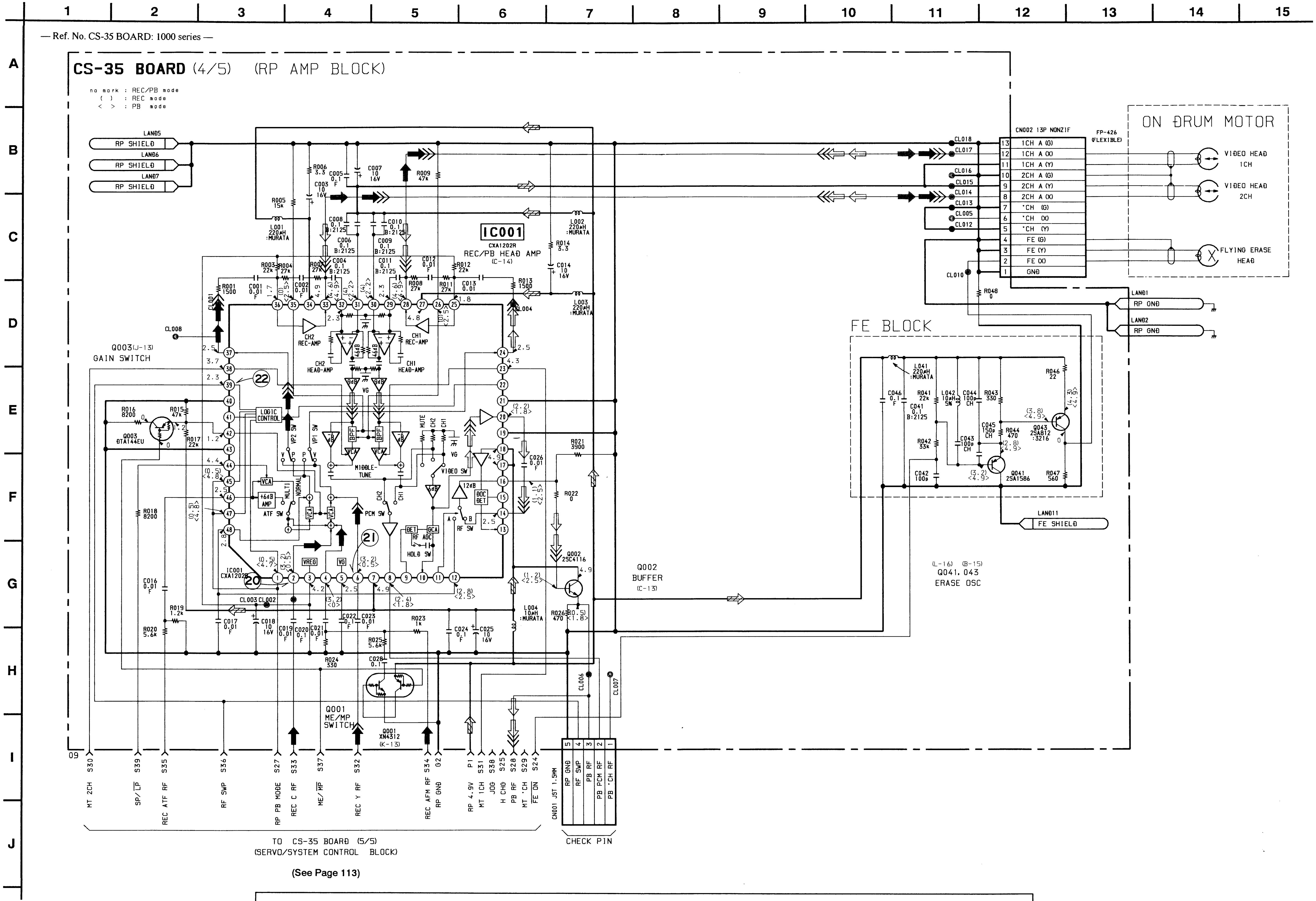
(See Page 113)

CS-35 (REC/PB AMP) SCHEMATIC DIAGRAM

• Refer to page 93 for Printed Wiring Board.

— Ref. No. CS-35 BOARD: 1000 series —


0.13Vp-p
C
0.22Vp-p
C
5Vp-p
C/PB
AUDIO SIGNAL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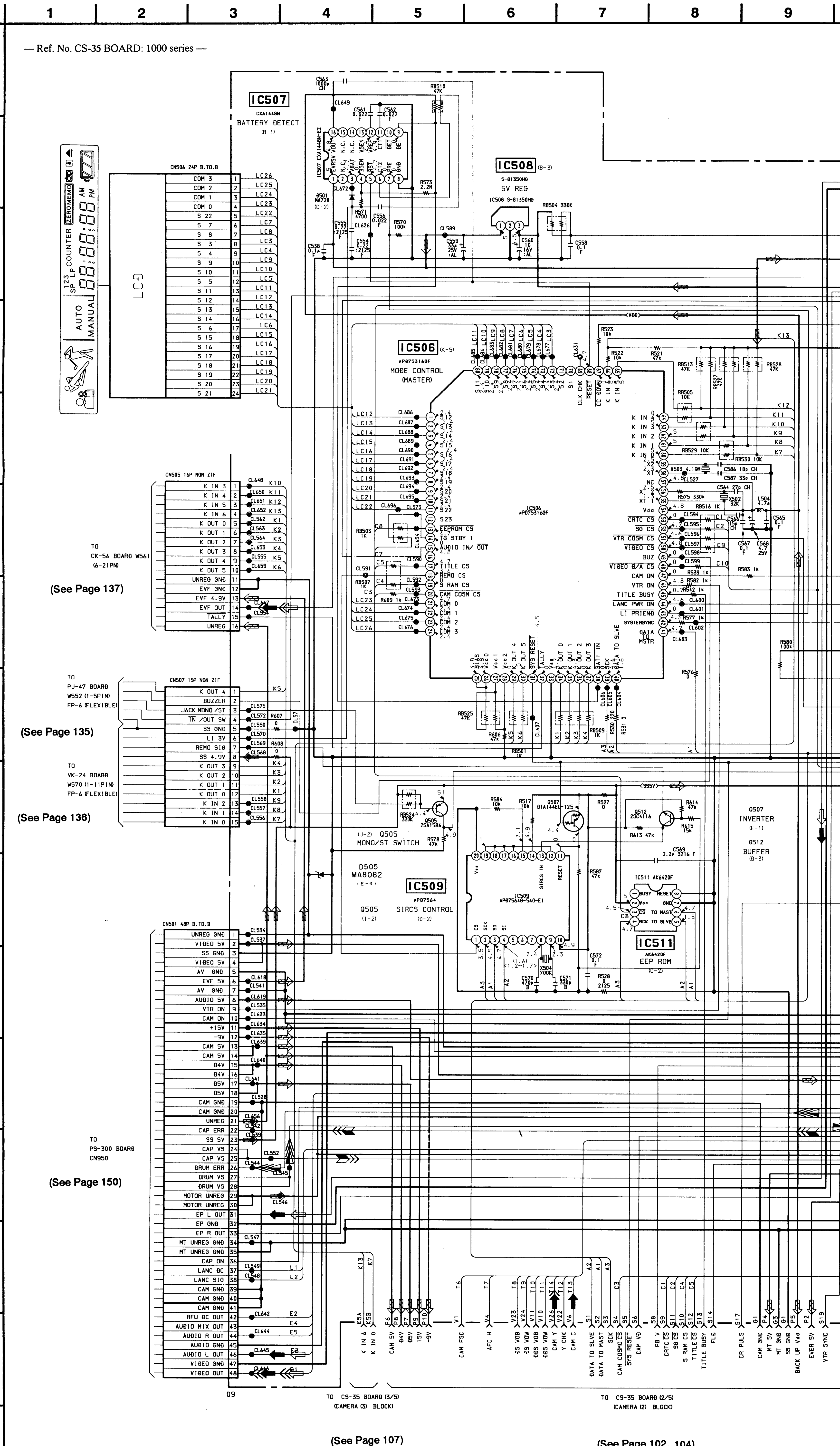
CS-35 BOARD (4/5) (RP AMP BLOCK)
no mark : REC/PB mode
( ) : REC mode
< > : PB mode
LAND5
RP SHIELD
LAND6
RP SHIELD
LAND7
RP SHIELD
IC001
CXA1202R
REC/PB HEAD AMP
(C-14)
CH2 REC-AMP
CH1 REC-AMP
CH2 HEAD-AMP
CH1 HEAD-AMP
LOGIC CONTROL
VP2 SW
VP1 SW
MIDDLE-TUNE
VIDEO SW
MUTE
ATF SW
PCM SW
RF SW
HOLD SW
RF AGC
DET
GCA
DOC DET
VREG
VG
MULTI
NORMAL
VCA
+6dB AMP
12dB
Q003(J-13)
GAIN SWITCH
Q003
DTA144EU
IC001
CXA1202R
CL008
CL001
CL002
CL003
Q001
ME/MP
SWITCH
Q001
XN4312
(K-13)
Q002
2SC4116
Q002
BUFFER
(C-13)
L001 220μH :MURATA
L002 220μH :MURATA
L003 220μH :MURATA
L004 10μH :MURATA
CL004
CL006
CL007
CN002 13P NONZIF
FP-426 (FLEXIBLE)
13 1CH A (G)
12 1CH A (X)
11 1CH A (Y)
10 2CH A (G)
9 2CH A (Y)
8 2CH A (X)
7 'CH (G)
6 'CH (X)
5 'CH (Y)
4 FE (G)
3 FE (Y)
2 FE (X)
1 GND
CL018
CL017
CL016
CL015
CL014
CL013
CL005
CL012
CL010
ON DRUM MOTOR
VIDEO HEAD 1CH
VIDEO HEAD 2CH
FLYING ERASE HEAD
LAND1
RP GND
LAND2
RP GND
FE BLOCK
L041 220μH :MURATA
Q041 2SA1586
Q043 2SA812 :3216
(L-16) (B-15)
Q041, 043
ERASE OSC
LAND11
FE SHIELD
09
S30 MT 2CH
S39 SP/LP
S35 REC ATF RF
S36 RF SWP
S27 RP PB MODE
S33 REC C RF
S37 ME/MP
S32 REC Y RF
S34 REC AFM RF
G2 RP GND
P1 RP 4.9V
S31 MT 1CH
S38 JOG
S25 H CHG
S28 PB RF
S29 MT 'CH
S24 FE ON
CN001 JST 1.5MM
5 RP GND
4 RF SWP
3 PB RF
2 PB PCM RF
1 PB 'CH RF
CHECK PIN
TO CS-35 BOARD (5/5)
(SERVO/SYSTEM CONTROL BLOCK)
(See Page 113)

— Ref. No. CS-35 BOARD: 1000 series —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K
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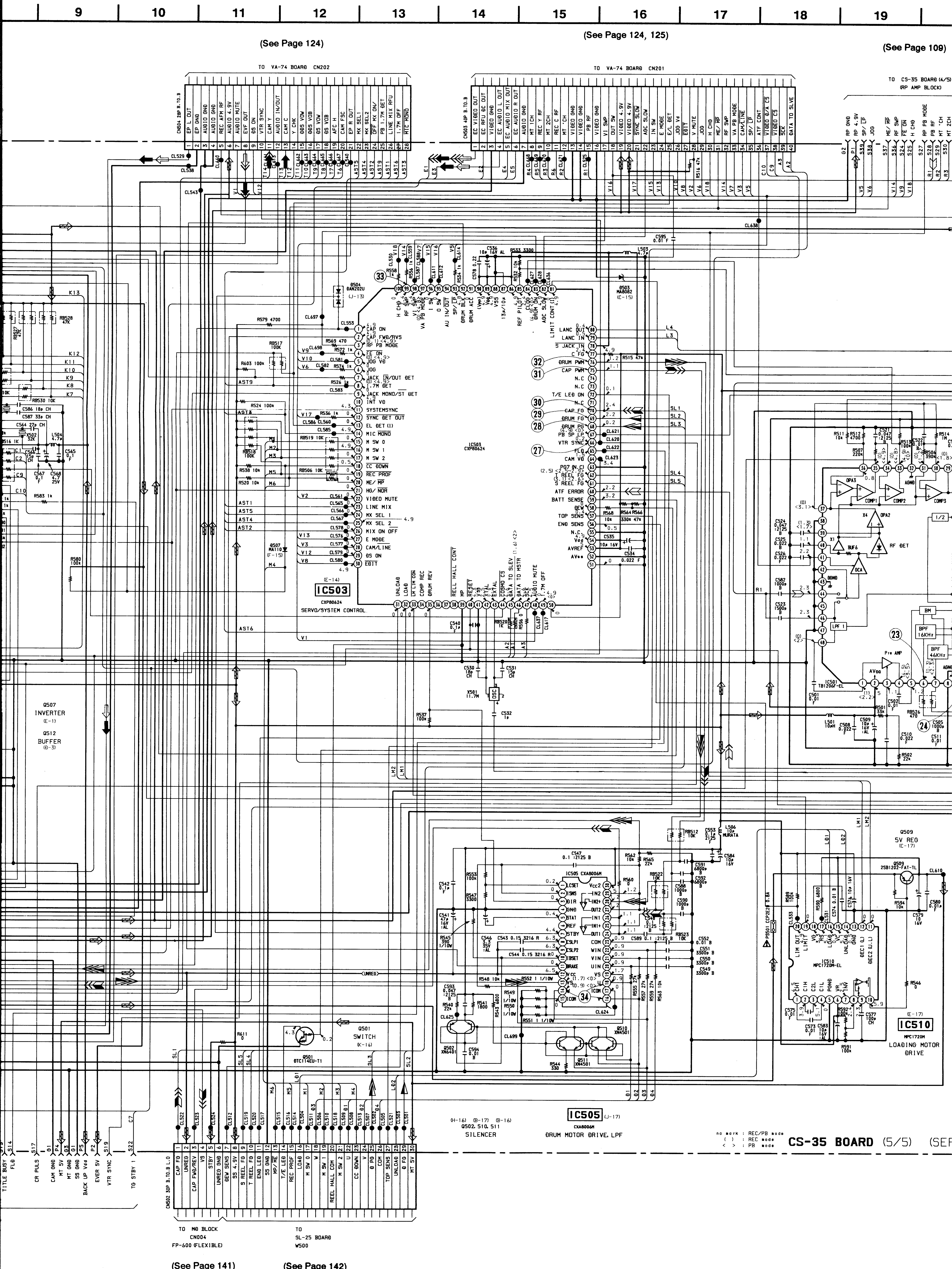
M
N
O
P
IC507
CXA1448N
BATTERY DETECT
IC508
S-81350HG
5V REG
IC506
MODE CONTROL
(MASTER)
IC509
SIRCS CONTROL
IC511
AK6420F
EEP ROM
Q505
MONO/ST SWITCH
D505
MA8082
Q507
INVERTER
Q512
BUFFER
LCD
AUTO
MANUAL
COUNTER
ZEROMEMO
AM
PM
CN506 24P B.TO.B
CN505 16P NON ZIF
CN507 15P NON ZIF
CN501 48P B.TO.B
TO CK-56 BOARD W561 (6-21PIN)
(See Page 137)
TO PJ-47 BOARD W552 (1-5PIN) FP-6 (FLEXIBLE)
(See Page 135)
TO VK-24 BOARD W570 (1-11PIN) FP-6 (FLEXIBLE)
(See Page 136)
TO PS-300 BOARD CN950
(See Page 150)
TO CS-35 BOARD (3/5) (CAMERA (3) BLOCK)
(See Page 107)
TO CS-35 BOARD (2/5) (CAMERA (2) BLOCK)
(See Page 102, 104)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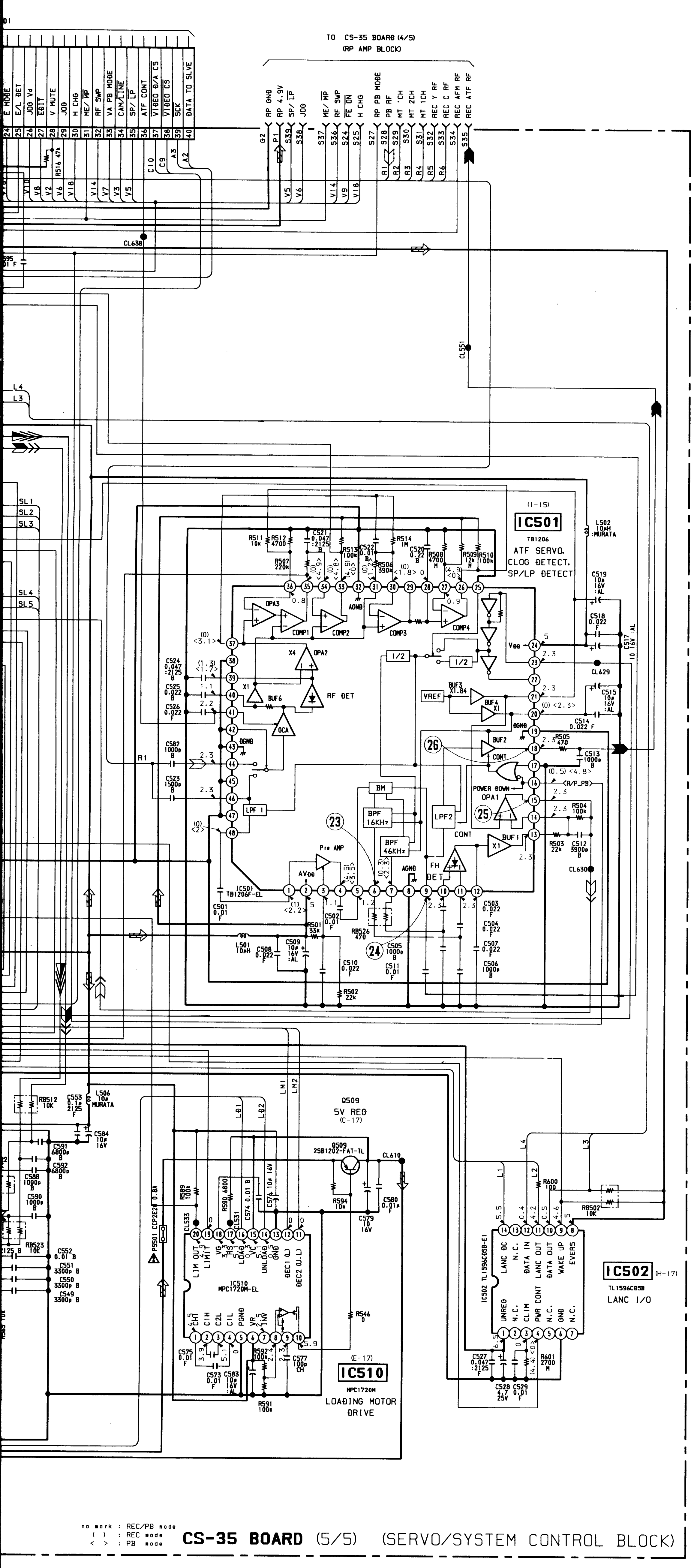
17
18
19
(See Page 124)
(See Page 124, 125)
(See Page 109)
TO VA-74 BOARD CN202
TO VA-74 BOARD CN201
TO CS-35 BOARD (4/5) (RP AMP BLOCK)
CN504 28P B.TO.B
CN503 40P B.TO.B
IC503
CXP80624
SERVO/SYSTEM CONTROL
Q507 INVERTER (E-1)
Q512 BUFFER (B-3)
Q501 SWITCH (K-16)
Q509 5V REG (C-17)
IC501 TB1206F-EL
IC505 CXA8006M
DRUM MOTOR DRIVE, LPF
Q502, 510, 511 SILENCER
IC510 MPC1720M
LOADING MOTOR DRIVE
CN502 30P B.TO.B L.O
TO MD BLOCK CN004 FP-600 (FLEXIBLE)
TO SL-25 BOARD W500
(See Page 141)
(See Page 142)

no mark : REC/PB mode
( ) : REC mode
< > : PB mode

CS-35 BOARD (5/5) (SEF

25)

(See Page 109)


TO CS-35 BOARD (4/5) (RP AMP BLOCK)
IC501 TB1206 ATF SERVO, CLOG DETECT, SP/LP DETECT
IC501 TB1206F-EL
Q509 5V REG
Q509 2SB1202-FAT-TL
IC510 MPC1720H LOADING MOTOR DRIVE
IC510 MPC1720H-EL
IC502 TL1596C05B LANC I/O
RF DET
Pre AMP
BPF 16KHz
BPF 46KHz
LPF 1
LPF2
POWER DOWN OPA1
FH DET
VREF
COMP1
COMP2
COMP3
COMP4
BUF1
BUF2
BUF3
BUF4
BUF6
OPA2
OPA3
GCA
BM

no mark : REC/PB mode
( ) : REC mode
< > : PB mode

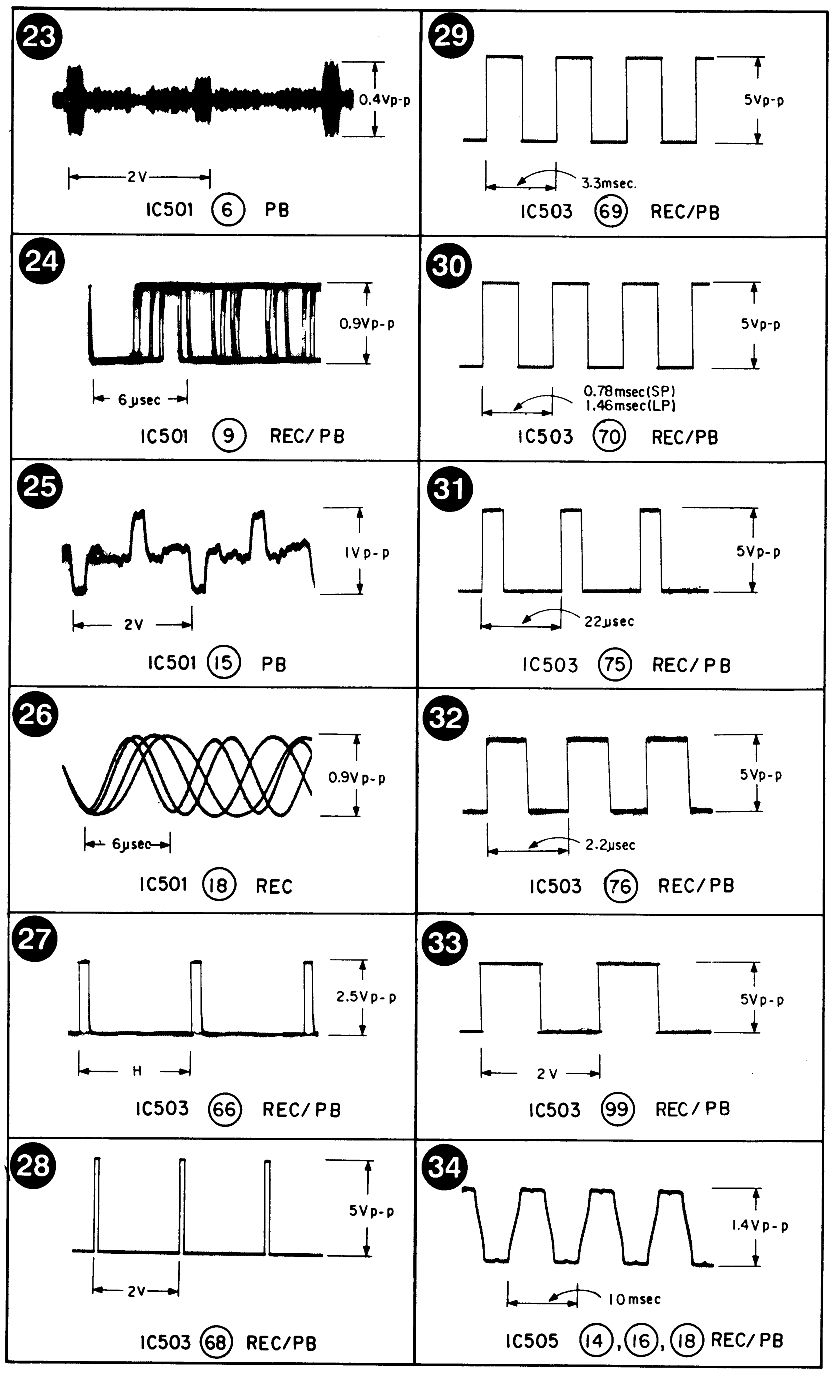
CS-35 BOARD (5/5) (SERVO/SYSTEM CONTROL BLOCK)

- **SIGNAL PATH**

	VIDEO SIGNAL			AUDIO SIGNAL
	CHROMA	Y	Y/CHROMA	
REC	➡	➡»	➡»»	➡
PB	⇨	⇨»	⇨»»	⇨

	REC	REC/PB	PB
Drum speed servo		▷	
Drum phase servo		▷»	
Drum servo (speed and phase)		▷»»	
Capstan speed servo			
Capstan phase servo	▶»	▷»»	▷»
Capstan servo (speed and phase)		▷»	
Ref. signal	▶	▷	▷

CS-35 BOARD (5/5)



(DIODE)

D102	8-719-800-76	DIODE	1SS226
D201	8-719-941-86	DIODE	DAN202U
D202	8-719-941-86	DIODE	DAN202U
D203	8-719-941-09	DIODE	DAP202U
D205	8-719-941-86	DIODE	DAN202U
D206	8-719-941-86	DIODE	DAN202U
D301	8-719-940-45	DIODE	DWA010
D361	8-719-941-86	DIODE	DAN202U
D362	8-719-941-86	DIODE	DAN202U

(IC)

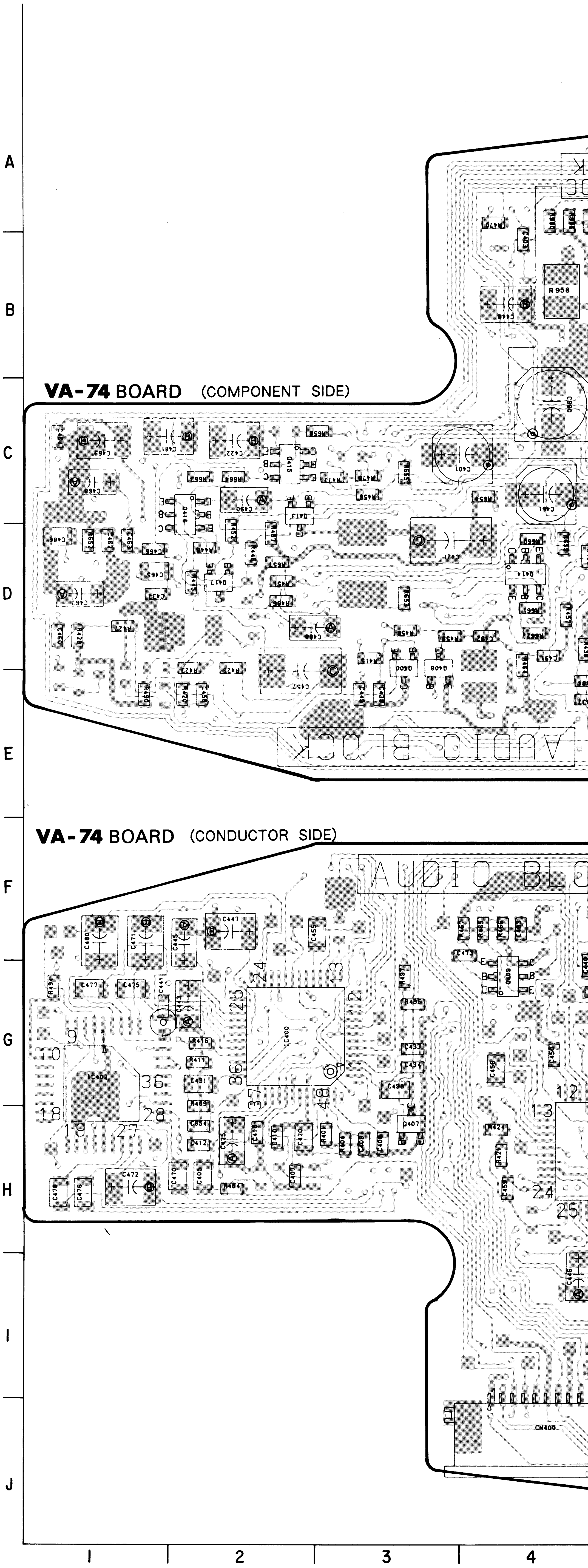
IC051	8-752-333-24	IC	CXL1506M
IC052	8-759-710-29	IC	NJM2235M
IC053	8-759-031-84	IC	SC7S04F
IC054	8-752-053-21	IC	CXA1211M
IC201	8-752-036-19	IC	CXA1207R
IC202	8-759-710-29	IC	NJM2235M
IC203	8-759-067-51	IC	MB88347PFV-ER
IC204	8-759-635-27	IC	M62352GP
IC205	8-759-636-33	IC	CXA1452N
IC206	8-752-053-21	IC	CXA1211M
IC301	8-752-036-20	IC	CXA1208R
IC361	8-759-605-61	IC	CXA1203N
IC400	8-759-823-19	IC	CXA1488R
IC401	8-759-823-19	IC	CXA1488R
IC402	8-759-823-21	IC	CXA1536Q

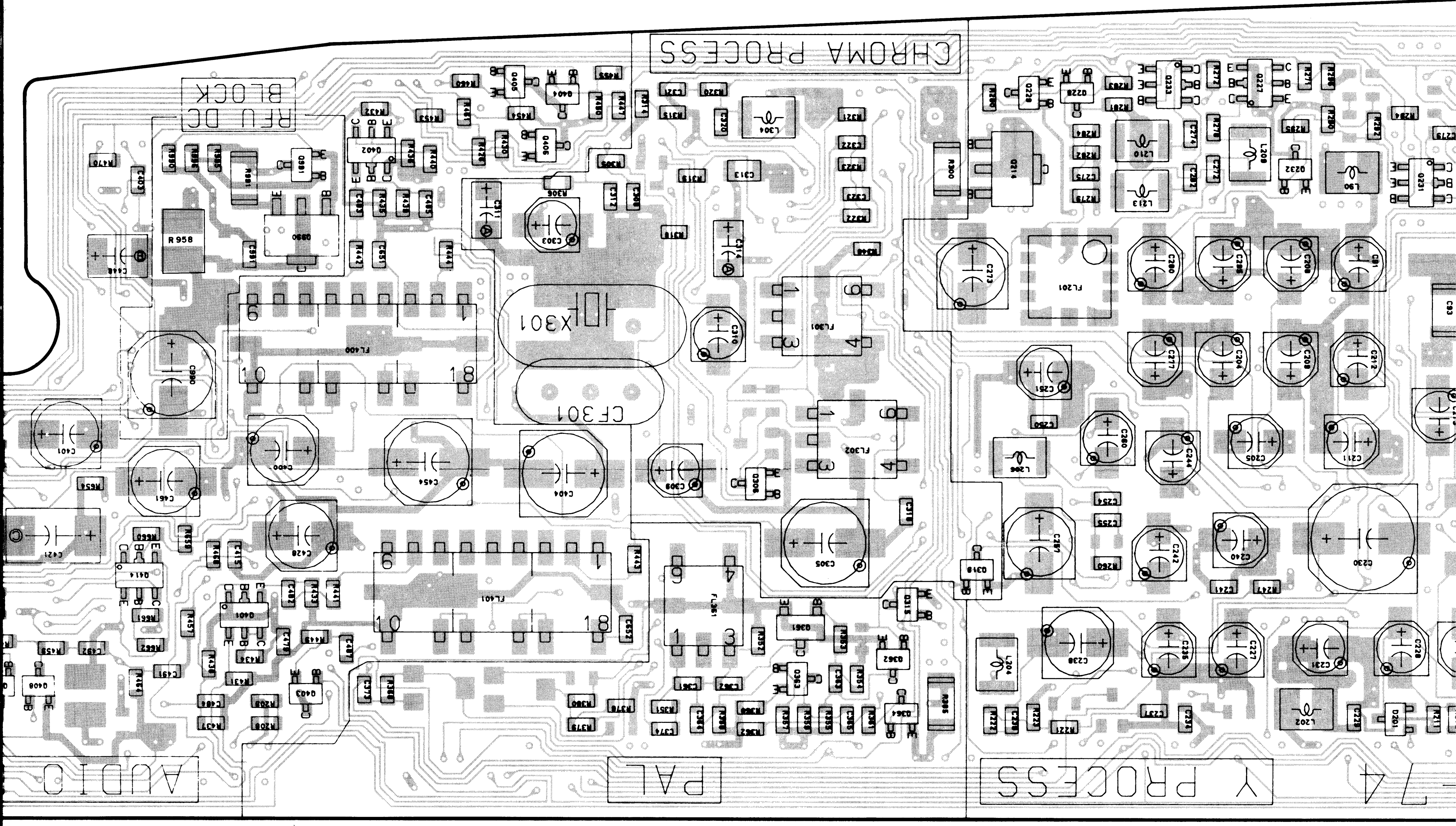
(TRANSISTOR)

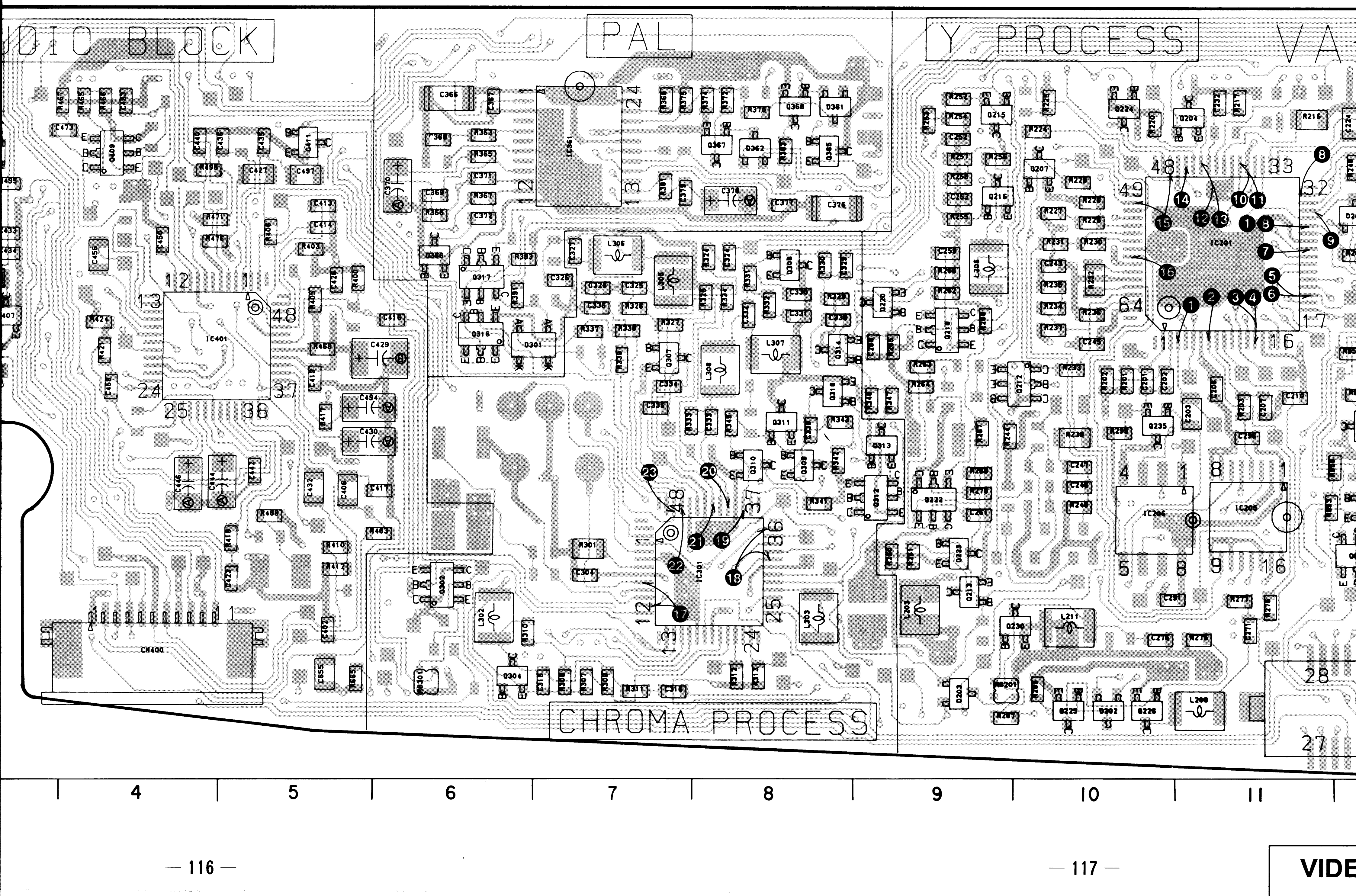
Q051	8-729-920-48	TRANSISTOR	IMH2
Q052	8-729-141-48	TRANSISTOR	2SB624-BV345
Q053	8-729-905-23	TRANSISTOR	2SA1576-R
Q054	8-729-905-23	TRANSISTOR	2SA1576-R
Q055	8-729-120-28	TRANSISTOR	2SC1623-L5L6
Q056	8-729-120-28	TRANSISTOR	2SC1623-L5L6
Q057	8-729-120-28	TRANSISTOR	2SC1623-L5L6
Q060	8-729-120-28	TRANSISTOR	2SC1623-L5L6
Q061	8-729-120-28	TRANSISTOR	2SC1623-L5L6
Q063	8-729-422-54	TRANSISTOR	XN4215
Q064	8-729-120-28	TRANSISTOR	2SC1623-L5L6
Q065	8-729-120-28	TRANSISTOR	2SC1623-L5L6
Q066	8-729-905-23	TRANSISTOR	2SA1576-R
Q067	8-729-905-96	TRANSISTOR	DTA114TU
Q103	8-729-120-28	TRANSISTOR	2SC1623-L5L6
Q104	8-729-120-28	TRANSISTOR	2SC1623-L5L6
Q110	8-729-920-XX	TRANSISTOR	DTA114EU
Q111	8-729-102-07	TRANSISTOR	2SC2223-F13
Q114	8-729-120-28	TRANSISTOR	2SC1623-L5L6
Q118	8-729-920-48	TRANSISTOR	IMH2
Q119	8-729-905-23	TRANSISTOR	2SA1576-R
Q120	8-729-102-07	TRANSISTOR	2SC2223-F13
Q122	8-729-120-28	TRANSISTOR	2SC1623-L5L6
Q202	8-729-905-23	TRANSISTOR	2SA1576-R
Q204	8-729-120-28	TRANSISTOR	2SC1623-L5L6
Q207	8-729-905-12	TRANSISTOR	DTA144EU
Q212	8-729-920-48	TRANSISTOR	IMH2
Q213	8-729-905-18	TRANSISTOR	DTC144EU
Q214	8-729-101-07	TRANSISTOR	2SB798-DL
Q215	8-729-120-28	TRANSISTOR	2SC1623-L5L6
Q216	8-729-120-28	TRANSISTOR	2SC1623-L5L6
Q218	8-729-402-81	TRANSISTOR	XN4501
Q220	8-729-120-28	TRANSISTOR	2SC1623-L5L6
Q222	8-729-402-81	TRANSISTOR	XN4501
Q223	8-729-905-12	TRANSISTOR	DTA144EU
Q224	8-729-905-18	TRANSISTOR	DTC144EU
Q225	8-729-905-18	TRANSISTOR	DTC144EU
Q226	8-729-823-16	TRANSISTOR	2SC4555-5. 6. 7
Q227	8-729-920-48	TRANSISTOR	IMH2
Q228	8-729-120-28	TRANSISTOR	2SC1623-L5L6
Q229	8-729-120-28	TRANSISTOR	2SC1623-L5L6
Q230	8-729-905-23	TRANSISTOR	2SA1576-R
Q231	8-729-925-42	TRANSISTOR	IMT2
Q232	8-729-905-23	TRANSISTOR	2SA1576-R
Q233	8-729-925-42	TRANSISTOR	IMT2
Q235	8-729-905-23	TRANSISTOR	2SA1576-R
Q302	8-729-402-81	TRANSISTOR	XN4501
Q304	8-729-905-12	TRANSISTOR	DTA144EU
Q306	8-729-120-28	TRANSISTOR	2SC1623-L5L6
Q307	8-729-120-28	TRANSISTOR	2SC1623-L5L6
Q308	8-729-905-23	TRANSISTOR	2SA1576-R
Q309	8-729-120-28	TRANSISTOR	2SC1623-L5L6
Q310	8-729-905-18	TRANSISTOR	DTC144EU
Q311	8-729-905-23	TRANSISTOR	2SA1576-R
Q312	8-729-420-20	TRANSISTOR	XN4312
Q313	8-729-905-12	TRANSISTOR	DTA144EU
Q314	8-729-120-28	TRANSISTOR	2SC1623-L5L6
Q315	8-729-905-12	TRANSISTOR	DTA144EU
Q316	8-729-920-48	TRANSISTOR	IMH2
Q317	8-729-420-20	TRANSISTOR	XN4312
Q318	8-729-905-18	TRANSISTOR	DTC144EU
Q319	8-729-905-18	TRANSISTOR	DTC144EU
Q361	8-729-102-07	TRANSISTOR	2SC2223-F13
Q362	8-729-905-18	TRANSISTOR	DTC144EU
Q363	8-729-120-28	TRANSISTOR	2SC1623-L5L6
Q364	8-729-905-12	TRANSISTOR	DTA144EU
Q365	8-729-120-28	TRANSISTOR	2SC1623-L5L6
Q366	8-729-905-18	TRANSISTOR	DTC144EU
Q367	8-729-905-18	TRANSISTOR	DTC144EU
Q368	8-729-905-12	TRANSISTOR	DTA144EU
Q400	8-729-905-23	TRANSISTOR	2SA1576-R
Q401	8-729-402-81	TRANSISTOR	XN4501
Q402	8-729-402-81	TRANSISTOR	XN4501
Q403	8-729-120-28	TRANSISTOR	2SC1623-L5L6
Q404	8-729-905-99	TRANSISTOR	DTC114TU
Q405	8-729-905-99	TRANSISTOR	DTC114TU
Q406	8-729-905-99	TRANSISTOR	DTC114TU
Q407	8-729-905-18	TRANSISTOR	DTC144EU
Q408	8-729-905-18	TRANSISTOR	DTC144EU
Q409	8-729-402-81	TRANSISTOR	XN4501
Q411	8-729-905-18	TRANSISTOR	DTC144EU
Q413	8-729-905-99	TRANSISTOR	DTC114TU
Q414	8-729-403-27	TRANSISTOR	XN4401
Q415	8-729-420-20	TRANSISTOR	XN4312
Q416	8-729-402-81	TRANSISTOR	XN4501
Q417	8-729-821-88	TRANSISTOR	2SK1332-3
Q990	8-729-101-07	TRANSISTOR	2SB798-DL
Q991	8-729-120-28	TRANSISTOR	2SC1623-L5L6

VA-74 (VIDEO, AUDIO (STEREO)) PRINTED WIRING BOARD

— Ref. No. VA-74 BOARD: 2000 series —




CHROMA PROCESS
RFU DC BLOCK
AUDIO
PAL
Y PROCESS
X301
CF301
FL400
FL401
FL301
FL302
FL361
FL201


AUDIO BLOCK
PAL
Y PROCESS
VA
CHROMA PROCESS
IC401
IC361
IC301
IC201
IC206
IC205
CN400
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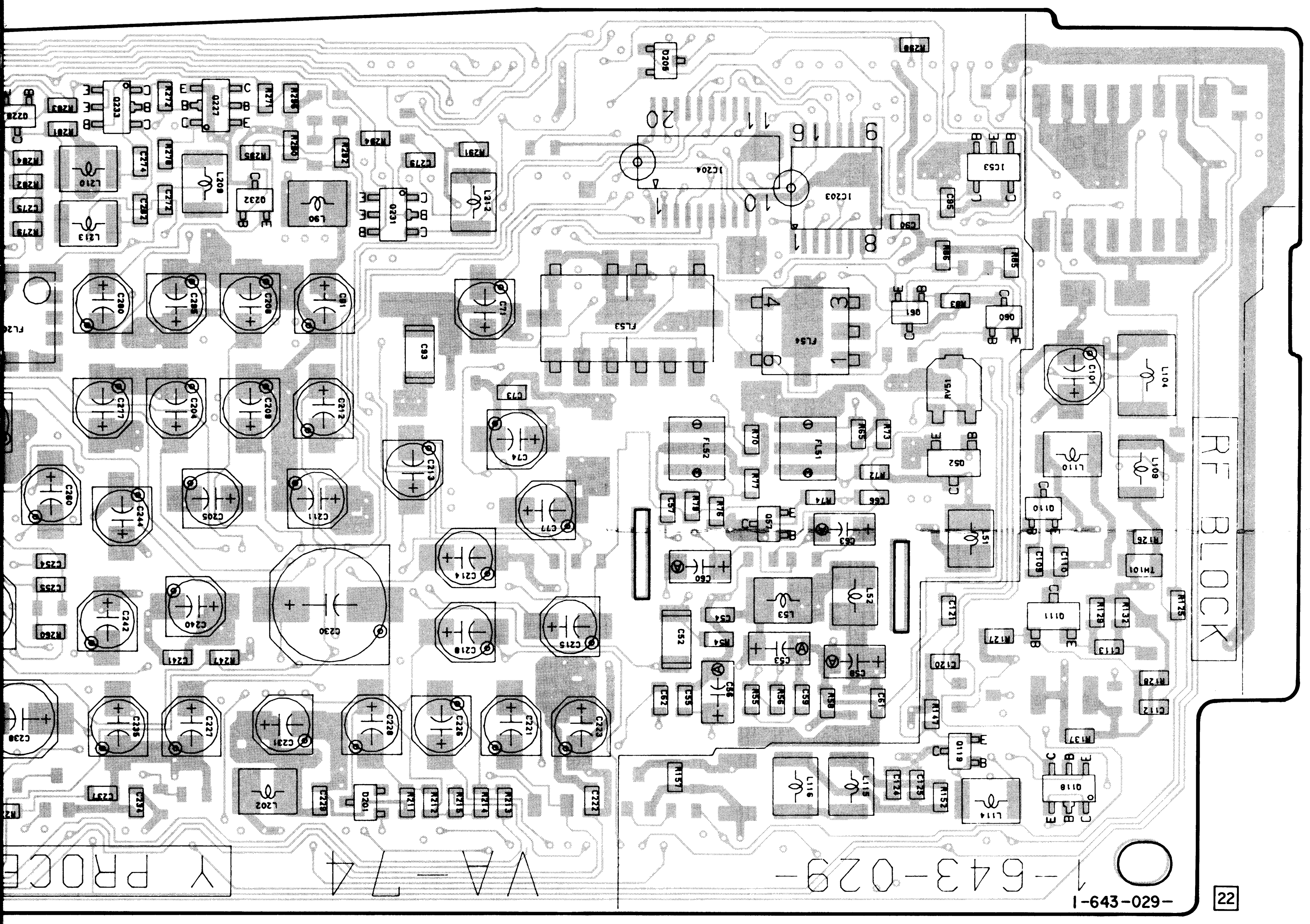
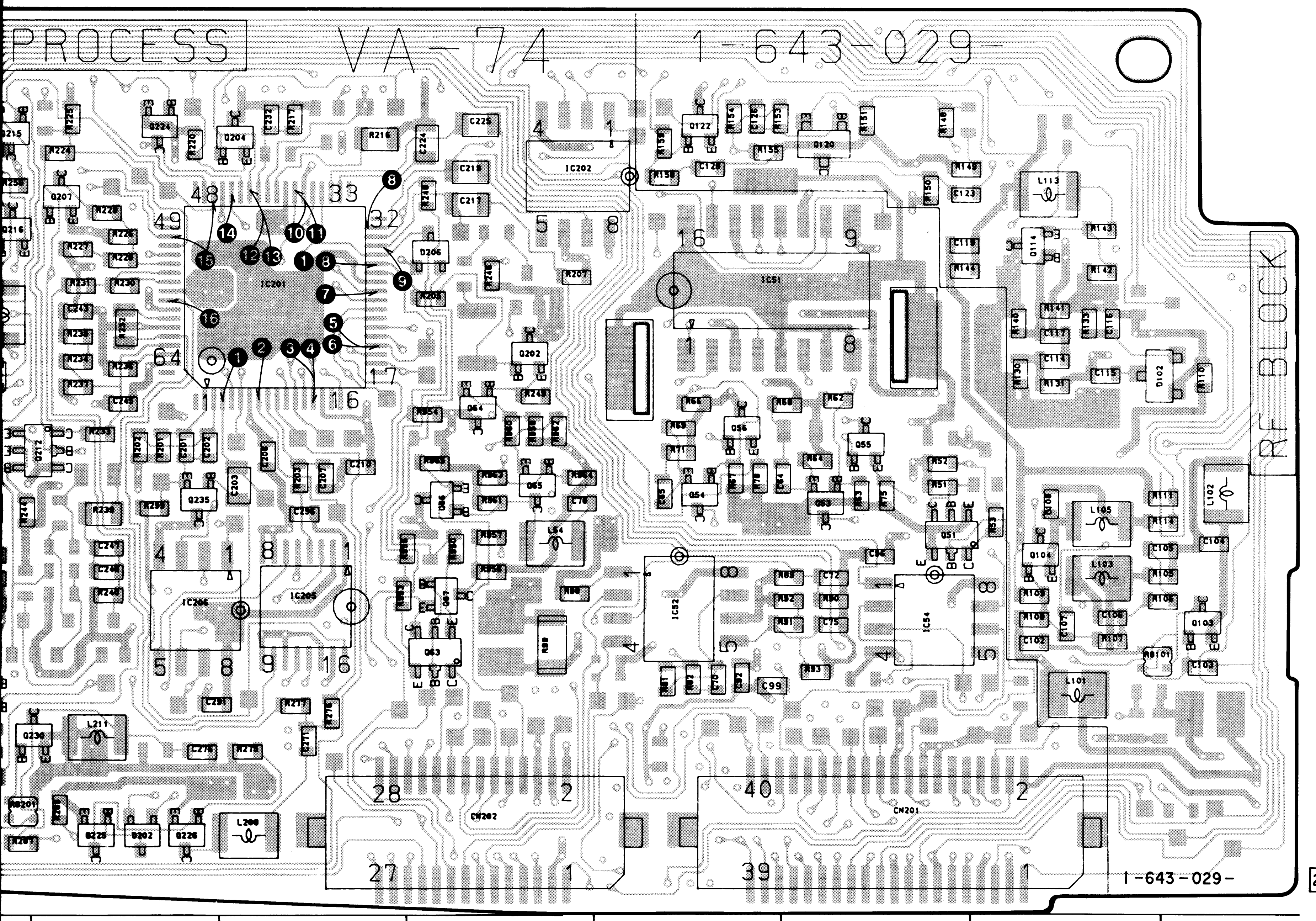
11


Y PROCE
VA-74
1-643-029
RF BLOCK
1-643-029-
22


PROCESS
VA-74
1-643-029
RF BLOCK
IC201
IC202
IC51
IC52
IC54
IC205
IC206
CN202
CN201
1-643-029-
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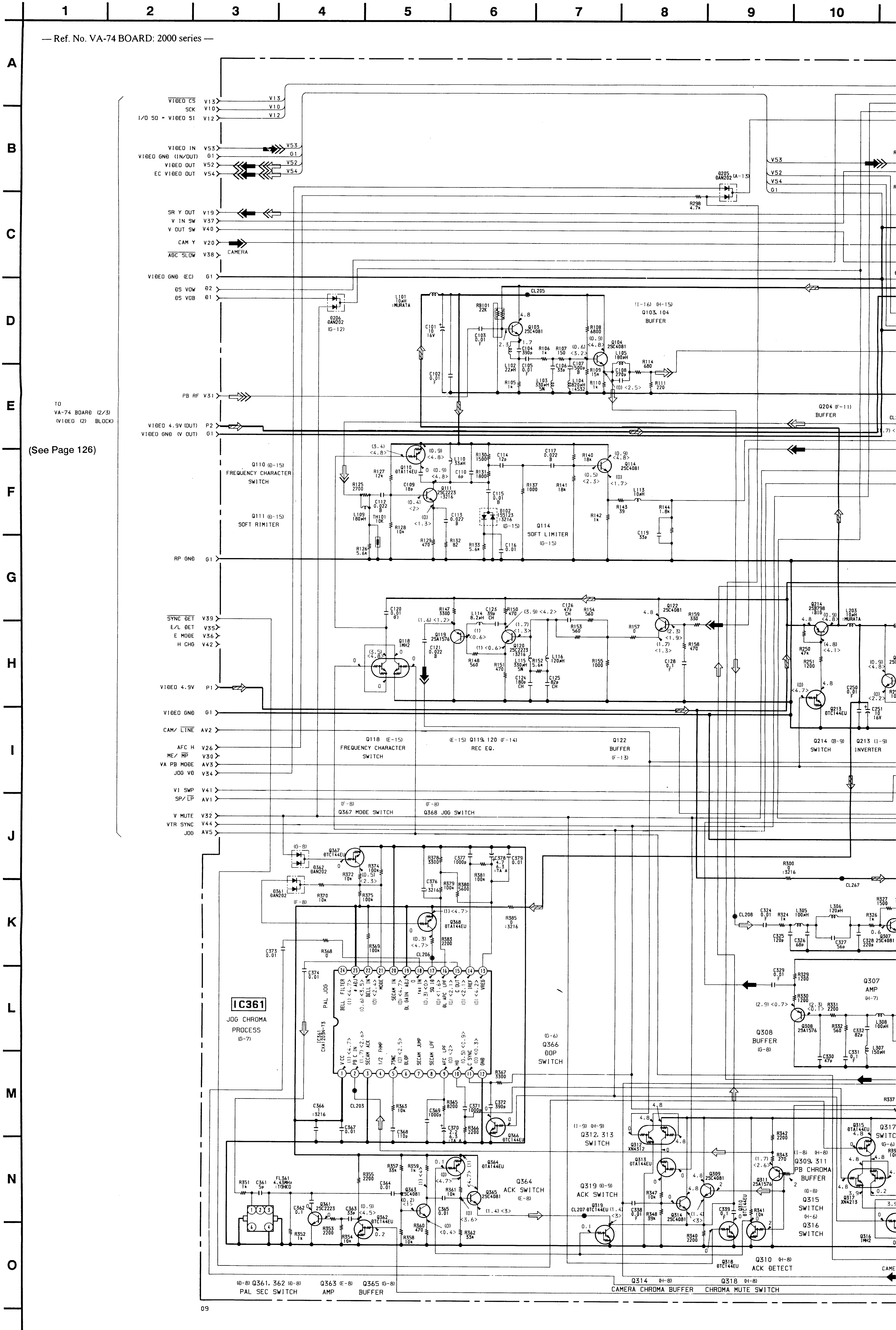
VA-74 (VIDEO) SCHEMATIC DIAGRAM

• Refer to page 115 for Printed Wiring Board.

— Ref. No. VA-74 BOARD: 2000 series —



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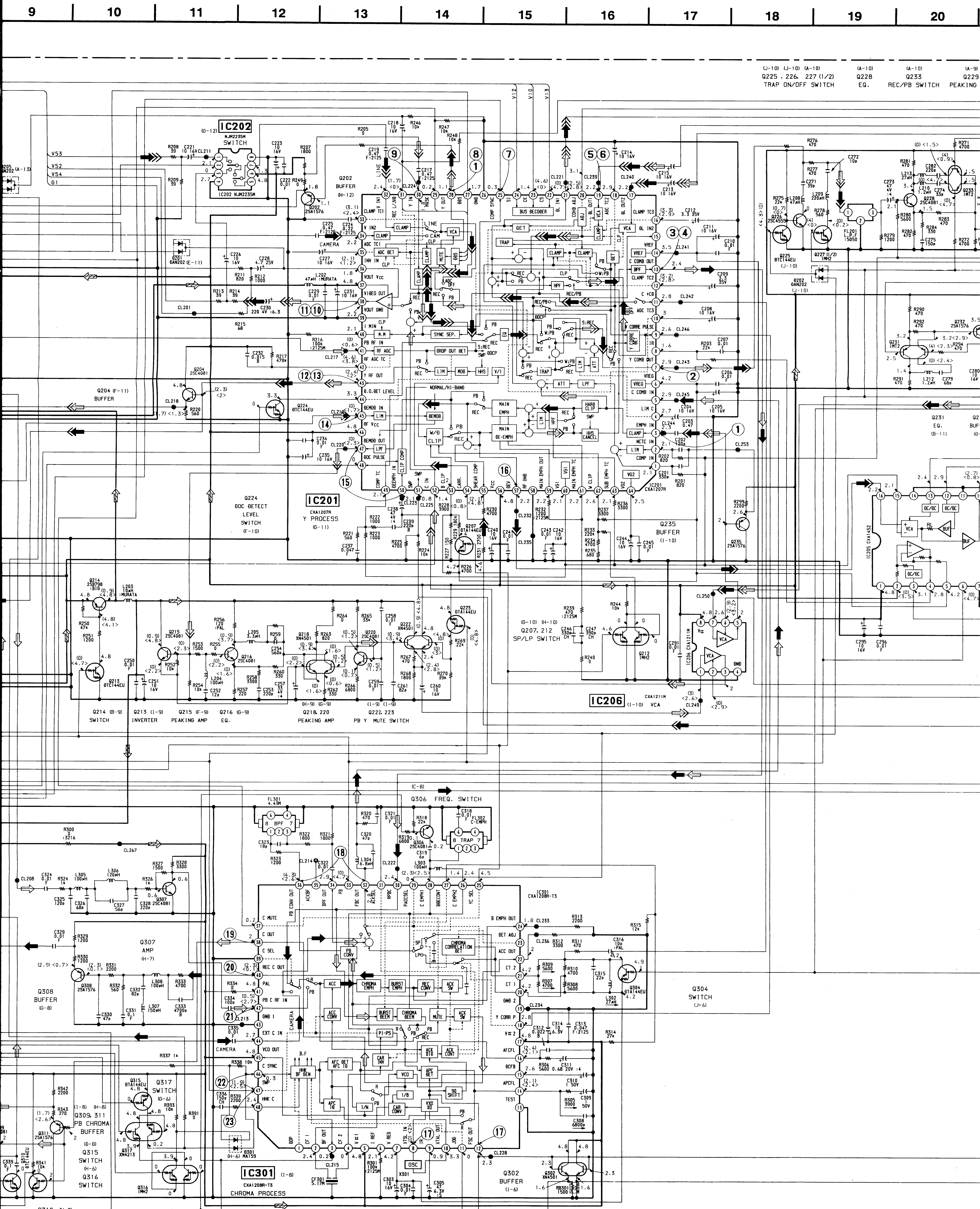
M
N
O
TO
VA-74 BOARD (2/3)
(VIDEO (2) BLOCK)
(See Page 126)
VIDEO CS V13
SCK V10
I/O SO • VIDEO SI V12
VIDEO IN V53
VIDEO GND (IN/OUT) G1
VIDEO OUT V52
EC VIDEO OUT V54
SR Y OUT V19
V IN SW V37
V OUT SW V40
CAM Y V20
CAMERA
AGC SLOW V38
VIDEO GND (EC) G1
DS VOW 02
DS VOB 01
PB RF V31
VIDEO 4.9V (OUT) P2
VIDEO GND (V OUT) G1
RP GND G1
SYNC DET V39
E/L DET V35
E MODE V36
H CHG V42
VIDEO 4.9V P1
VIDEO GND G1
CAM/ LINE AV2
AFC H V26
ME/ MP V30
VA PB MODE AV3
JOG VD V34
VI SWP V41
SP/ LP AV1
V MUTE V32
VTR SYNC V44
JOG AV5
D206 DAN202 (G-12)
D205 DAN202 (A-13)
R298 4.7k
L101 10μH :MURATA
CL205
(I-16) (H-15) Q103, 104 BUFFER
Q103 2SC4081
Q104 2SC4081
Q110 (G-15) FREQUENCY CHARACTER SWITCH
Q111 (G-15) SOFT RIMITER
Q110 DTA114EU
Q111 2SC2223 :3216
Q114 2SC4081
Q114 SOFT LIMITER (G-15)
D102 1SS123 :3216
TH101 10K
Q204 (F-11) BUFFER
Q118 IMH2
Q119 2SA1576
Q120 2SC2223 :3216
Q122 2SC4081
Q118 (E-15) FREQUENCY CHARACTER SWITCH
(E-15) Q119, 120 (F-14) REC EQ.
Q122 BUFFER (F-13)
Q214 2SB798 :B16
L203 10μH :MURATA
Q213 DTC144EU
Q214 (B-9) SWITCH
Q213 (I-9) INVERTER
(F-8) Q367 MODE SWITCH
(F-8) Q368 JOG SWITCH
Q367 DTC144EU
D362 DAN202
D361 DAN202
Q368 DTA144EU
IC361 JOG CHROMA PROCESS (G-7)
CXA1034N-T3
BELL FILTER
ADJ
BELL IN
MODE
SECAM IN
BL GAIN ADJ
SQ IN
BL APC LPF
C OUT
IREF
VREG
VCC
PB C IN
SECAM ACK
1/2 FHMP
75NC
BLDP
SECAM JUMP
SECAM LPF
AFC LPF
HD
C SYNC
GND
CL206
CL203
(G-6) Q366 DOP SWITCH
Q366 DTC144EU
R300 0 :3216
CL267
CL208
L305 100μH
L306 120μH
Q307 2SC4081
Q307 AMP (H-7)
Q308 2SA1576
Q308 BUFFER (G-8)
L307 150μH
L308 100μH
FL361 4.43MHz :TOKO
Q361 2SC2223
Q362 DTC144EU
Q363 2SC4081
Q364 DTA144EU
Q365 2SC4081
Q364 ACK SWITCH (E-8)
(I-9) (H-9) Q312, 313 SWITCH
Q312 XN4312
Q313 DTA144EU
Q319 (B-9) ACK SWITCH
CL207
Q319 DTC144EU
Q314 2SC4081
Q309 2SC4081
Q311 2SA1576
Q318 DTC144EU
(I-8) (H-8) Q309, 311 PB CHROMA BUFFER
(B-8) Q315 SWITCH
(H-6) Q316 SWITCH
Q315 DTA144EU
Q317 XN4213
Q316 IMH2
Q310 (H-8) ACK DETECT
(B-8) Q361, 362 (B-8) PAL SEC SWITCH
Q363 (E-8) AMP
Q365 (G-8) BUFFER
Q314 (H-8) CAMERA CHROMA BUFFER
Q318 (H-8) CHROMA MUTE SWITCH
09


9
10
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16
17
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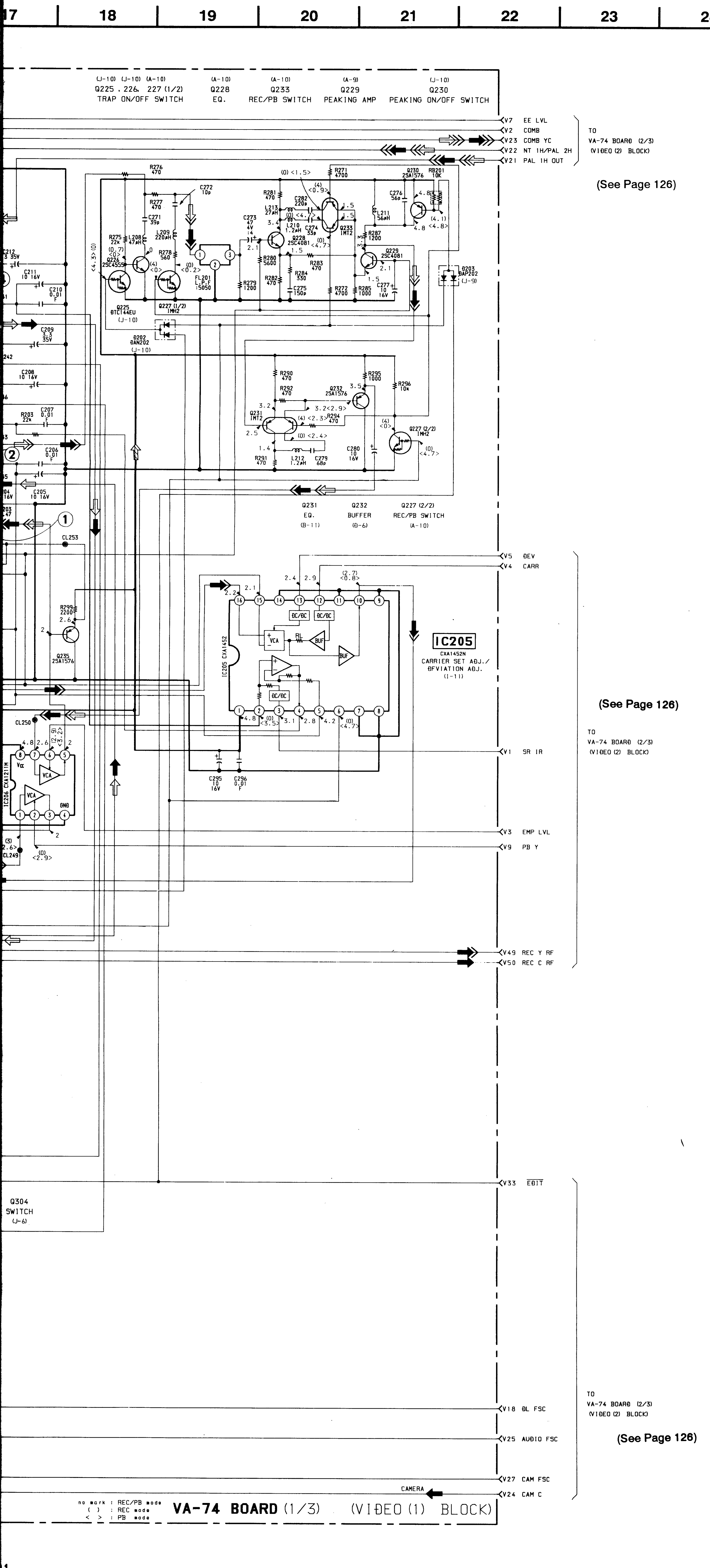
19
20
Q225, 226, 227 (1/2)
TRAP ON/OFF SWITCH
Q228
EQ.
Q233
REC/PB SWITCH
Q229
PEAKING
IC202
NJM2235M
SWITCH
Q202
BUFFER
Q204
BUFFER
Q224
DOC DETECT
LEVEL
SWITCH
IC201
CXA1207R
Y PROCESS
BUS DECODER
SYNC SEP.
DROP OUT DET
B.D.DET LEVEL
DEMOD
MAIN EMPH
MAIN DE-EMPH
HARD CLIP
HHS CANCEL
Q235
BUFFER
Q231
EQ.
IC205 CXA1452
IC206
CXA1211M
VCA
Q207, 212
SP/LP SWITCH
Q214
SWITCH
Q213
INVERTER
Q215
PEAKING AMP
Q216
EQ.
Q218, 220
PEAKING AMP
Q222, 223
PB Y MUTE SWITCH
Q306 FREQ. SWITCH
FL301
BPF
FL302
C-EMPH
TRAP
IC301
CXA1208R-T3
CHROMA PROCESS
CHROMA CORRELATION DET
CHROMA EMPH
BURST EMPH
REC CONV
ACK SW
BURST DEEM
CHROMA DEEM
MUTE
PJ-PS
ACK DET
ACK CONT
CAR INV
VCO
APC DET
AFC DET
AFC 10
HHK BF GEN
1/N
1/8
90 SHIFT
VXO XO
CAR CONV
OSC
Q307
AMP
Q308
BUFFER
Q309, 311
PB CHROMA
BUFFER
Q315
SWITCH
Q316
SWITCH
Q317
SWITCH
Q310
ACK DETECT
Q318
CHROMA MUTE SWITCH
Q302
BUFFER
Q304
SWITCH
CAMERA

no mark : REC/PB mode
( ) : REC mode
< > : PB mode

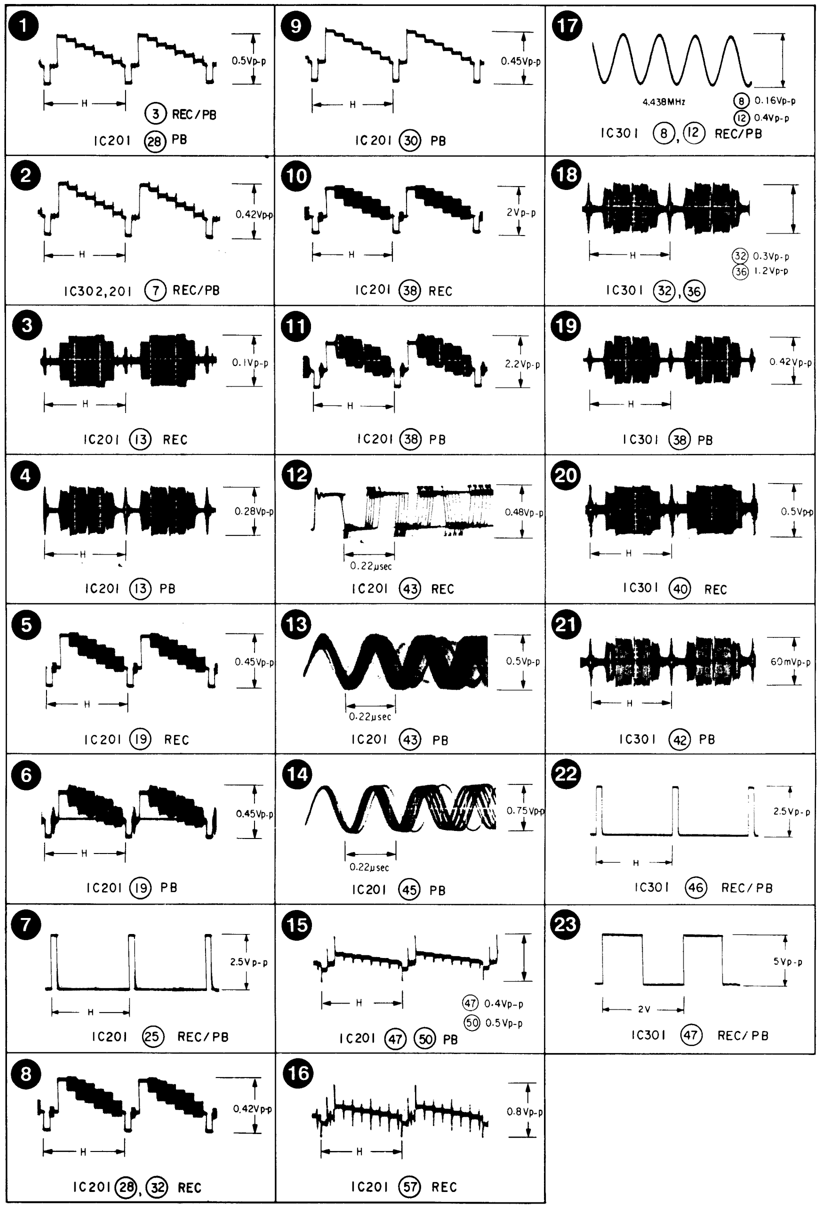
VA-74 BOARD (1/3)


17
18
19
20
21
22
23
24
25
26
27
28
(J-10) (J-10) (A-10) Q225 . 226. 227 (1/2) TRAP ON/OFF SWITCH
(A-10) Q228 EQ.
(A-10) Q233 REC/PB SWITCH
(A-9) Q229 PEAKING AMP
(J-10) Q230 PEAKING ON/OFF SWITCH
V7 EE LVL
V2 COMB
V23 COMB YC
V22 NT 1H/PAL 2H
V21 PAL 1H OUT
TO VA-74 BOARD (2/3) (VIDEO (2) BLOCK)
(See Page 126)
Q225 DTC144EU (J-10)
Q226 2SC4559
Q227 (1/2) IMH2
Q228 2SC4081
Q233 IMT2
Q229 2SC4081
Q230 2SA1576
D202 DAN202 (J-10)
D203 DAP202 (J-9)
FL201 L.P.F :5050
Q231 EQ. (B-11)
Q232 BUFFER (D-6)
Q227 (2/2) REC/PB SWITCH (A-10)
V5 DEV
V4 CARR
IC205 CXA1452N CARRIER SET ADJ./ DEVIATION ADJ. (I-11)
IC205 CXA1452
Q235 2SA1576
IC206 CXA1211M
CL250
CL249
CL253
(See Page 126)
TO VA-74 BOARD (2/3) (VIDEO (2) BLOCK)
V1 SR IR
V3 EMP LVL
V9 PB Y
V49 REC Y RF
V50 REC C RF
Q304 SWITCH (J-6)
V33 EDIT
TO VA-74 BOARD (2/3) (VIDEO (2) BLOCK)
V18 DL FSC
V25 AUDIO FSC
(See Page 126)
V27 CAM FSC
CAMERA
V24 CAM C
no mark : REC/PB mode
( ) : REC mode
< > : PB mode
VA-74 BOARD (1/3) (VIDEO (1) BLOCK)

- **SIGNAL PATH**

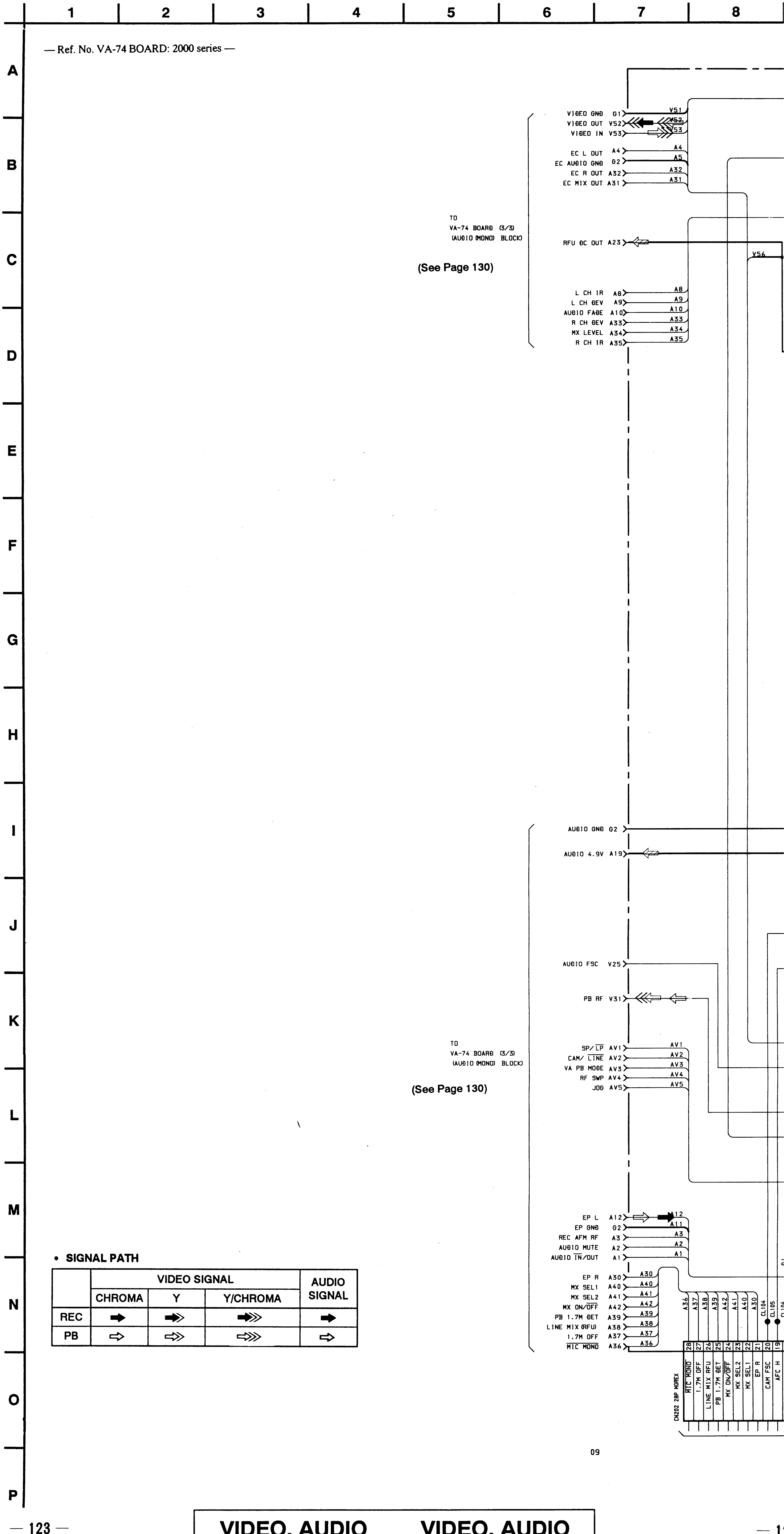
	VIDEO SIGNAL			AUDIO SIGNAL
	CHROMA	Y	Y/CHROMA	
REC	➡	➡»	➡»»	
PB	⇨	⇨»	⇨»»	

VA-74 BOARD (1/3)



VA-74 (VIDEO) SCHEMATIC DIAGRAM

- Refer to page 115 for Printed Wiring Board.


1
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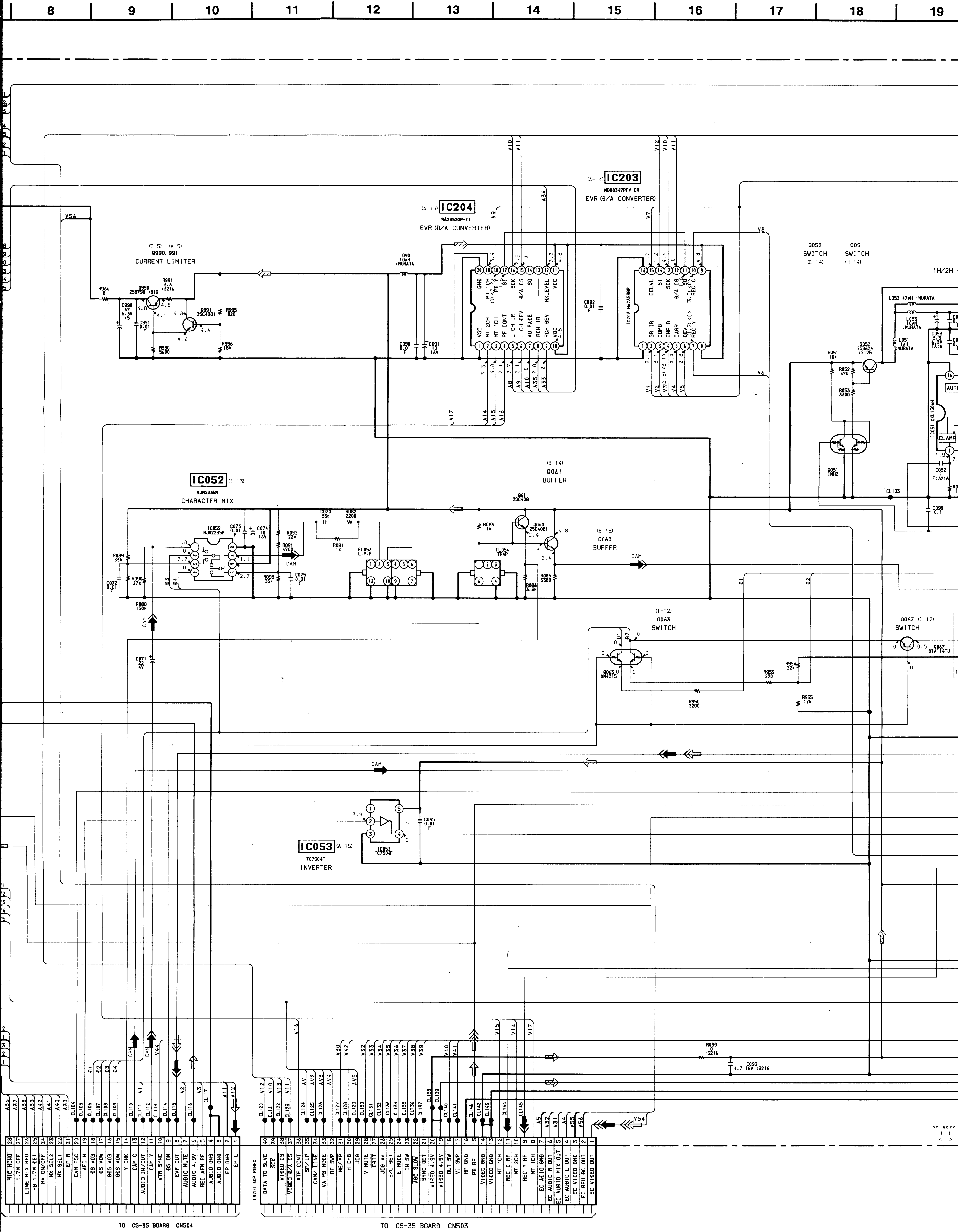
7
8
A
B
C
D
E
F
G
H
I
J
K
L
M
N
O
P
VIDEO GND G1
VIDEO OUT V52
VIDEO IN V53
V51
V52
V53
EC L OUT A4
EC AUDIO GND G2
EC R OUT A32
EC MIX OUT A31
A4
A5
A32
A31
TO
VA-74 BOARD (3/3)
(AUDIO (MONO) BLOCK)
(See Page 130)
RFU DC OUT A23
V56
L CH IR A8
L CH DEV A9
AUDIO FADE A10
R CH DEV A33
MX LEVEL A34
R CH IR A35
A8
A9
A10
A33
A34
A35
AUDIO GND G2
AUDIO 4.9V A19
AUDIO FSC V25
PB RF V31
TO
VA-74 BOARD (3/3)
(AUDIO (MONO) BLOCK)
(See Page 130)
SP/$\overline{\text{LP}}$ AV1
CAM/ $\overline{\text{LINE}}$ AV2
VA PB MODE AV3
RF SWP AV4
JOG AV5
AV1
AV2
AV3
AV4
AV5
EP L A12
EP GND G2
REC AFM RF A3
AUDIO MUTE A2
AUDIO $\overline{\text{IN}}$/OUT A1
A12
A11
A3
A2
A1
EP R A30
MX SEL1 A40
MX SEL2 A41
MX ON/$\overline{\text{OFF}}$ A42
PB 1.7M DET A39
LINE MIX (RFU) A38
1.7M OFF A37
$\overline{\text{MIC MONO}}$ A36
A30
A40
A41
A42
A39
A38
A37
A36
A36
A37
A38
A39
A42
A41
A40
A30
CL104
CL105
CN202 28P MOREX
28 $\overline{\text{MIC MONO}}$
27 1.7M OFF
26 LINE MIX RFU
25 PB 1.7M DET
24 MX ON/$\overline{\text{OFF}}$
23 MX SEL2
22 MX SEL1
21 EP R
20 CAM FSC
19 AFC H
09

— Ref. No. VA-74 BOARD: 2000 series —

- **SIGNAL PATH**

	VIDEO SIGNAL			AUDIO SIGNAL
	CHROMA	Y	Y/CHROMA	
REC	➡	➡»	➡»»	➡
PB	⇨	⇨»	⇨»»	⇨


8
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13
14
15
16
17
18
19
(A-14) IC203
MB88347PFV-ER
EVR (D/A CONVERTER)
(A-13) IC204
M62352GP-E1
EVR (D/A CONVERTER)
(B-5) (A-5)
Q990, 991
CURRENT LIMITER
Q990 2SB798 :B1G
Q991 2SC4081
R966 0
R991 3.3 :3216
R995 820
R996 18k
R990 5600
C990 47 6.3V :5
C991 0.01 F
L090 10µH :MURATA
C090 0.01 F
C091 10 16V
C092 0.01 F
V56
V9
V10
V11
V12
V7
V8
V6
A34
A17
A14
A16
A8
A9
A10
A35
A33
V1
V2
V3
V4
V5
GND
MT 1CH
PB
SI
SCK
D/A CS
SO
MXLEVEL
VCC
VSS
MT 2CH
MT CH
RF CONT
L CH IR
L CH DEV
AU FADE
RCH IR
RCH DEV
VDD
IC203 MB88347P
EELVL
SI
SCK
D/A CS
SO
REC C
SR IR
COMB
EMPLB
CARR
DEV
REC Y
Q052
SWITCH
(C-14)
Q051
SWITCH
(H-14)
1H/2H
L052 47µH :MURATA
L053 10µH :MURATA
L051 1µH :MURATA
C053 3.3 6.3V TA:A
R051 10k
R052 47k
R053 3300
Q052 2SB624 :2125
Q051 IMH2
IC051 CXL1506M
AUTO
CLAMP
C052 F:3216
C099 0.1
CL103
IC052 (I-13)
NJM2235M
CHARACTER MIX
IC052 NJM2235M
C073 0.01 F
C074 10 16V
R092 22k
R091 4700
R089 33k
R090 27k
R093 33k
C072 0.01 F
C075 0.01 F
R088 150k
CAM
D3
D4
C070 33p
R082 2200
R081 1k
FL053 L.P.F
FL054 TRAP
R083 1k
(B-14)
Q061
BUFFER
Q61 2SC4081
Q060 2SC4081
(B-15)
Q060
BUFFER
R085 3300
R086 3.3k
CAM
D1
D2
C071 22 4V
(I-12)
Q063
SWITCH
Q063 XN4215
R953 220
R950 2200
R954 22k
R955 12k
Q067 (I-12)
SWITCH
Q067 DTA114TU
CAM
IC053 (A-15)
TC7S04F
INVERTER
IC053 TC7S04F
C095 0.01 F
3.9
V16
V15
V14
V17
V30
V42
V32
V33
V34
V35
V36
V37
V38
V39
V40
V41
R099 0 :3216
C093 4.7 16V :3216
A36
A37
A38
A39
A42
A41
A40
A30
CL104
CL105
CL106
CL107
CL108
CL109
CL110
CL111
CL112
CL113
CL114
CL115
CL116
CL117
A1
A2
A3
A11
A12
V44
V12
V10
V13
V11
AV1
AV2
AV3
AV4
AV5
CL120
CL121
CL122
CL123
CL124
CL125
CL126
CL127
CL128
CL129
CL130
CL131
CL132
CL133
CL134
CL135
CL136
CL137
CL138
CL139
CL140
CL141
CL146
CL142
CL143
CL144
CL145
A5
A32
A31
A4
V55
V56
V54
28 MIC MONO
27 1.7M OFF
26 LINE MIX RFU
25 PB 1.7M DET
24 MX ON/OFF
23 MX SEL2
22 MX SEL1
21 EP R
20 CAM FSC
19 AFC H
18 DS VDB
17 DS VDW
16 DDS VDB
15 DDS VDW
14 Y CHK
13 CAM C
12 AUDIO IN/OUT
11 CAM Y
10 VTR SYNC
9 DS ON
8 EVF OUT
7 AUDIO MUTE
6 AUDIO 4.9V
5 REC AFM RF
4 AUDIO GND
3 AUDIO GND
2 EP GND
1 EP L
TO CS-35 BOARD CN504
CN201 40P MOREX
40 DATA TO SLVE
39 SCK
38 VIDEO CS
37 VIDEO D/A CS
36 ATF CONT
35 SP/LP
34 CAM/ LINE
33 VA PB MODE
32 RF SWP
31 ME/MP
30 H CHG
29 JOG
28 V MUTE
27 EDIT
26 JOG Vd
25 E/L DET
24 E MODE
23 IN SW
22 AGC SLOW
21 SYNC DET
20 VIDEO 4.9V
19 VIDEO 4.9V
18 OUT SW
17 VI SWP
16 RP GND
15 PB RF
14 VIDEO GND
13 VIDEO GND
12 MT 'CH
11 REC C RF
10 MT 2CH
9 REC Y RF
8 MT 1CH
7 EC AUDIO GND
6 EC AUDIO R OUT
5 EC AUDIO MIX OUT
4 EC AUDIO L OUT
3 EC VIDEO GND
2 EC RFU DC OUT
1 EC VIDEO OUT
TO CS-35 BOARD CN503
no mark
( )
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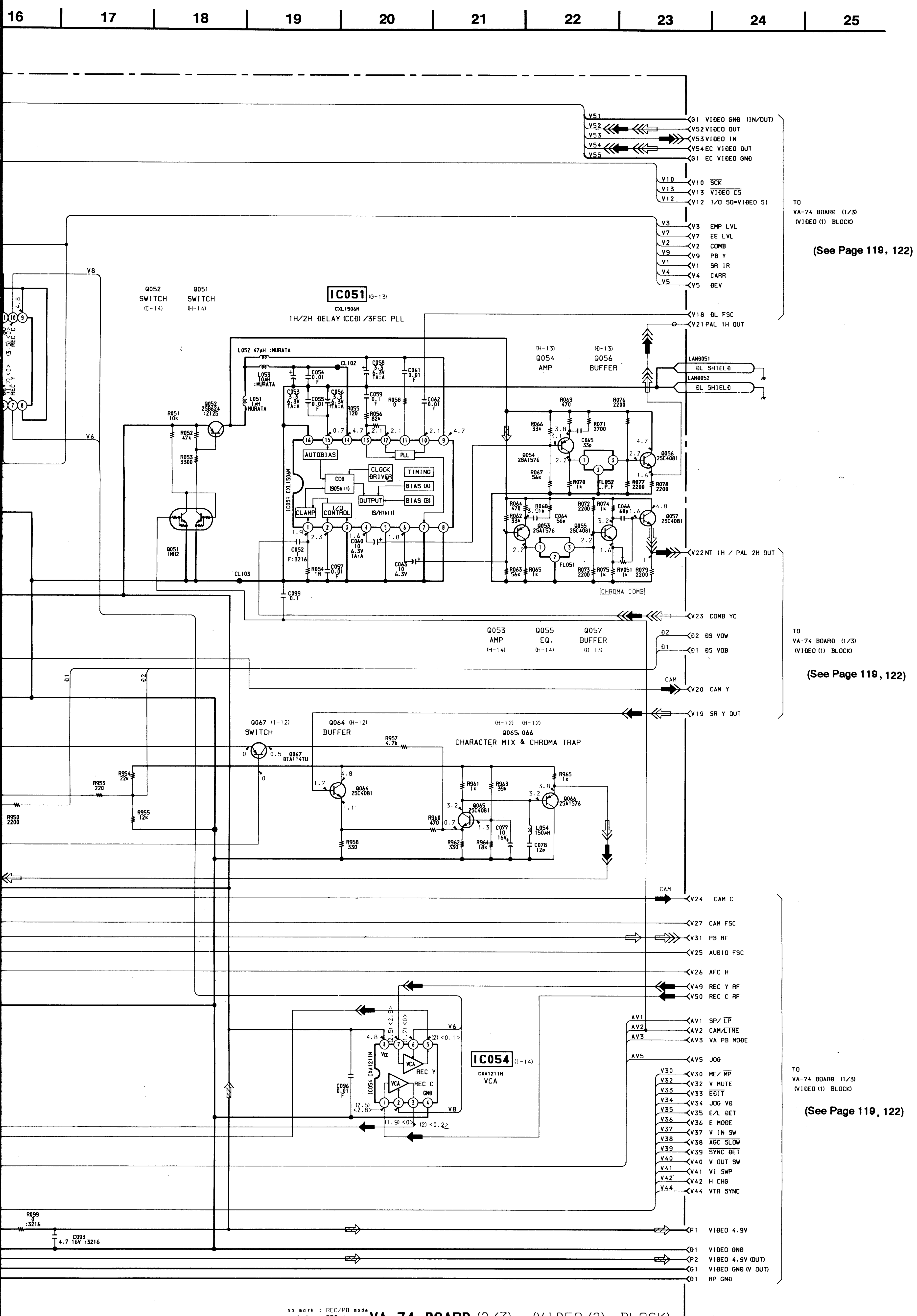
(See Page 112, 113)

(See Page 113)

VIDEO, AU


16
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18
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21
22
23
24
25
G1 VIDEO GND (IN/OUT)
VS2 VIDEO OUT
VS3 VIDEO IN
VS4 EC VIDEO OUT
G1 EC VIDEO GND
V10 SCK
V13 VIDEO CS
V12 I/O SO-VIDEO SI
V3 EMP LVL
V7 EE LVL
V2 COMB
V9 PB Y
V1 SR IR
V4 CARR
V5 DEV
V18 DL FSC
V21 PAL 1H OUT
TO
VA-74 BOARD (1/3)
(VIDEO (1) BLOCK)
(See Page 119, 122)
Q052
SWITCH
(C-14)
Q051
SWITCH
(H-14)
IC051 (G-13)
CXL1506M
1H/2H DELAY (CCD)/3FSC PLL
AUTOBIAS
CLOCK DRIVER
TIMING
CCD (905×11)
BIAS (A)
OUTPUT
BIAS (B)
CLAMP
I/O CONTROL
(5/H)(11)
PLL
(H-13)
Q054
AMP
(D-13)
Q056
BUFFER
LAN0051
DL SHIELD
LAN0052
DL SHIELD
CHROMA COMB
V22 NT 1H / PAL 2H OUT
V23 COMB YC
Q053
AMP
(H-14)
Q055
EQ.
(H-14)
Q057
BUFFER
(D-13)
D2 DS VDW
D1 DS VDB
TO
VA-74 BOARD (1/3)
(VIDEO (1) BLOCK)
(See Page 119, 122)
CAM
V20 CAM Y
V19 SR Y OUT
Q067 (I-12)
SWITCH
Q064 (H-12)
BUFFER
(H-12) (H-12)
Q065, 066
CHARACTER MIX & CHROMA TRAP
CAM
V24 CAM C
V27 CAM FSC
V31 PB RF
V25 AUDIO FSC
V26 AFC H
V49 REC Y RF
V50 REC C RF
AV1 SP/LP
AV2 CAM/LINE
AV3 VA PB MODE
AV5 JOG
V30 ME/MP
V32 V MUTE
V33 EDIT
V34 JOG VD
V35 E/L DET
V36 E MODE
V37 V IN SW
V38 AGC SLOW
V39 SYNC DET
V40 V OUT SW
V41 VI SWP
V42 H CHG
V44 VTR SYNC
IC054 (I-14)
CXA1211M
VCA
REC Y
REC C
TO
VA-74 BOARD (1/3)
(VIDEO (1) BLOCK)
(See Page 119, 122)
P1 VIDEO 4.9V
G1 VIDEO GND
P2 VIDEO 4.9V (OUT)
G1 VIDEO GND (V OUT)
G1 RP GND

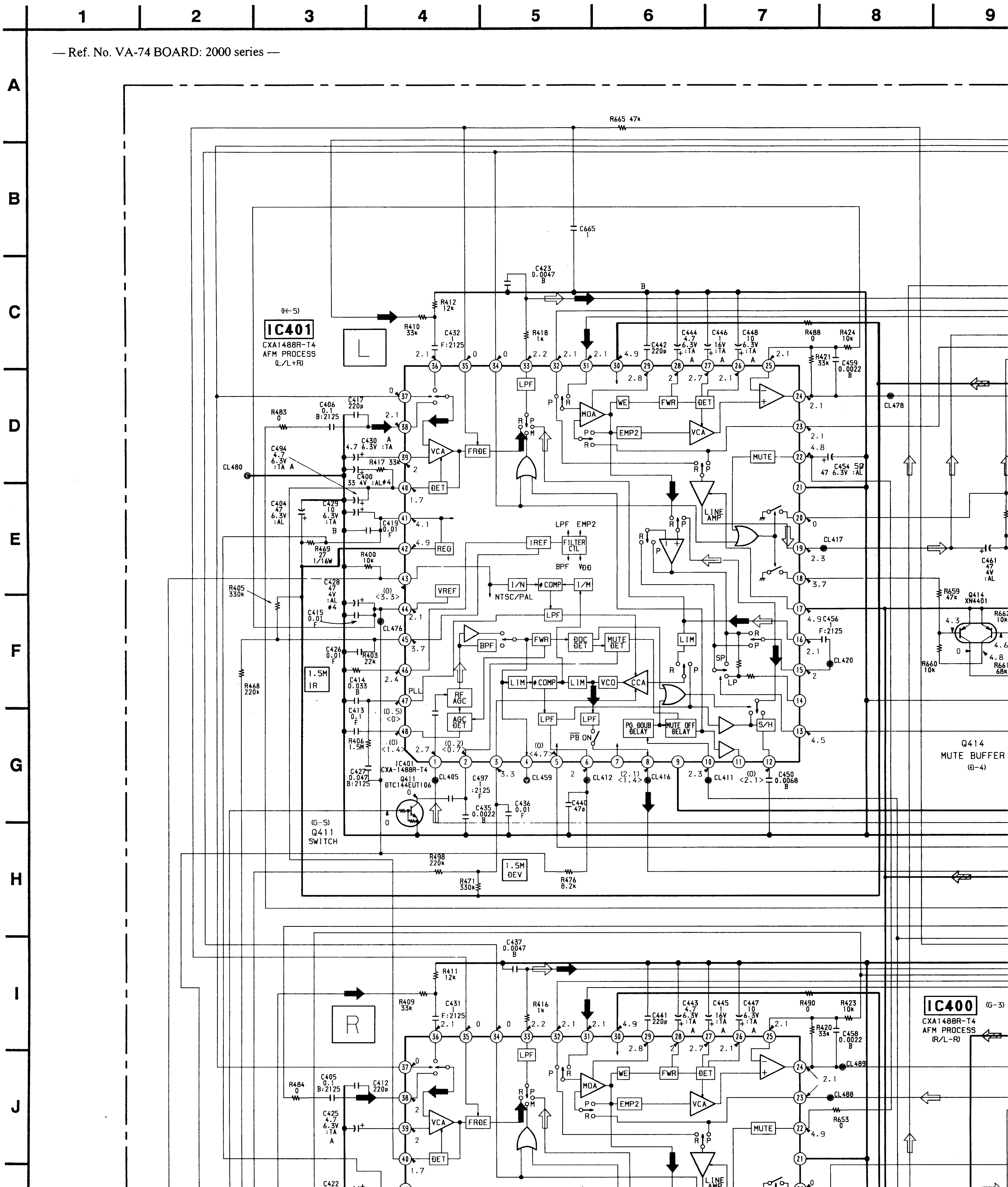
no mark : REC/PB mode
( ) : REC mode
< > : PBmode

VA-74 BOARD (2/3) (VIDEO (2) BLOCK)

VA-74 (AUDIO (STEREO)) SCHEMATIC DIAGRAM

• Refer to page 115 for Printed Wiring Board.

— Ref. No. VA-74 BOARD: 2000 series —



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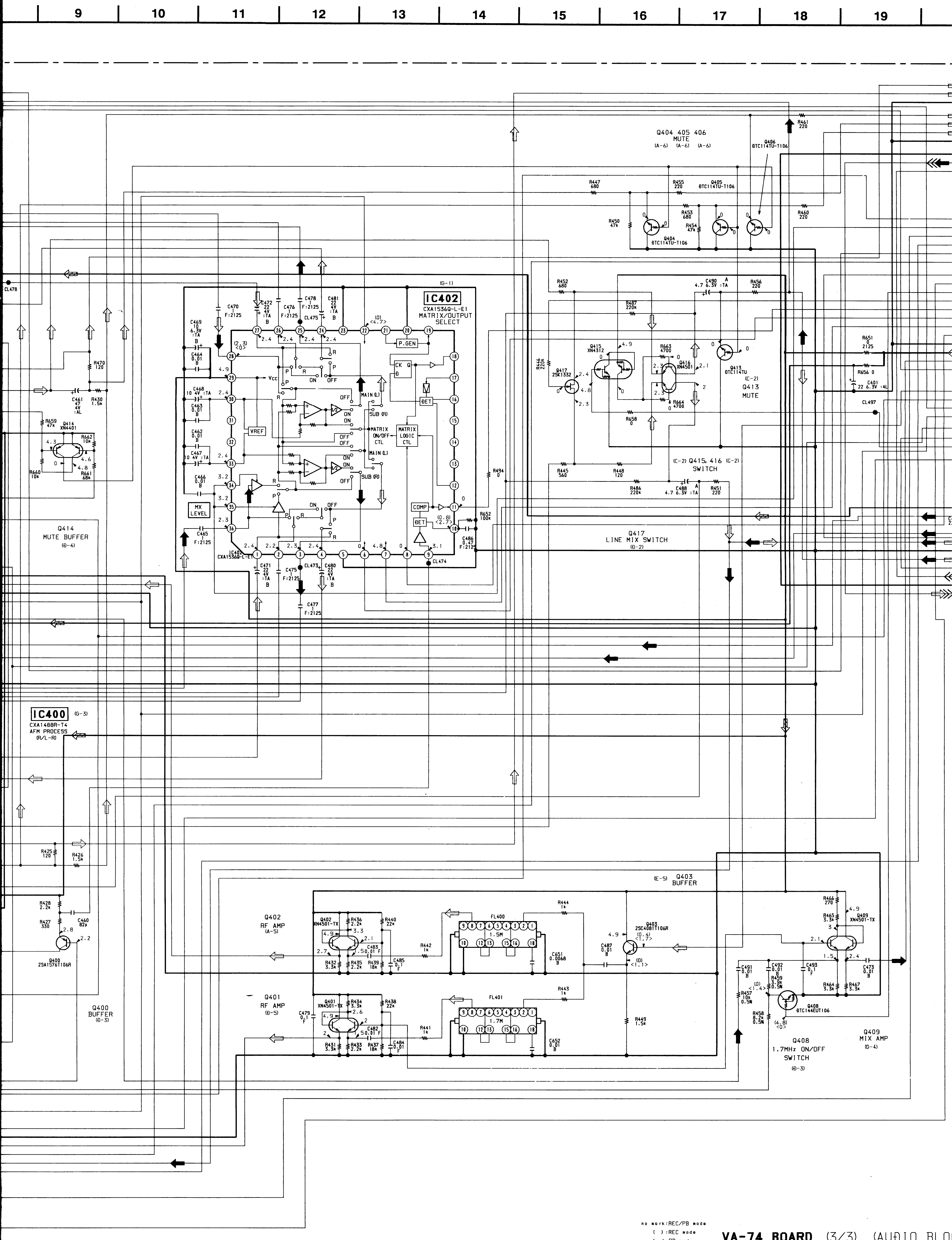
8
9
A
B
C
D
E
F
G
H
I
J
K
L
M
N
O
R665 47k
C665 1
C423 0.0047 B
(H-5)
IC401
CXA1488R-T4
AFM PROCESS
(L/L+R)
L
R412 12k
R410 33k
C432 1 F:2125
R418 1k
C442 220p
C444 4.7 6.3V :TA
C446 1 16V :TA
C448 10 6.3V :TA
R488 0
R424 10k
R421 33k
C459 0.0022 B
CL478
R483 0
C406 0.1 B:2125
C417 220p
C494 4.7 6.3V :TA A
C430 33 4V :AL#4
R417 33k
C400
CL480
C404 47 6.3V :AL
C429 10 6.3V :TA B
C419 0.01 F
R469 27 1/16W
R400 10k
R405 330k
C428 47 4V :AL #4
C415 0.01 F
CL476
C426 0.01 F
R403 22k
C414 0.033 B
C413 0.1 F
R406 1.5M
C427 0.047 B:2125
R468 220k
1.5M IR
LPF
MOA
WE
FWR
DET
EMP2
VCA
VCA
FRDE
DET
MUTE
LINE AMP
REG
IREF
LPF EMP2
FILTER CTL
BPF VDD
VREF
I/N
COMP
I/M
NTSC/PAL
LPF
BPF
FWR
DOC DET
MUTE DET
LIM
LIM
COMP
LIM
VCO
CCA
SP
LP
RF AGC
AGC DET
PLL
LPF
LPF
PB ON
PG DOUB DELAY
MUTE OFF DELAY
S/H
CL417
C454 47 6.3V :AL
C456 F:2125
CL420
C450 0.0068 B
CL411
CL416
CL412
CL459
CL405
C440 47p
C497 1 :2125 F
C435 0.0022 B
C436 0.01 F
IC401
CXA-1488R-T4
Q411
DTC144EUT106
(G-5)
Q411
SWITCH
R498 220k
R471 330k
1.5M DEV
R476 8.2k
C461 47 4V :AL
R659 47k
Q414 XN4401
R660 10k
R662 10k
R661 68k
Q414
MUTE BUFFER
(B-4)
C437 0.0047 B
R
R411 12k
R409 33k
C431 1 F:2125
R416 1k
C441 220p
C443 4.7 6.3V :TA
C445 1 16V :TA
C447 10 6.3V :TA
R490 0
R423 10k
R420 33k
C458 0.0022 B
CL489
CL488
R653 0
IC400
(G-3)
CXA1488R-T4
AFM PROCESS
(R/L-R)
R484 0
C405 0.1 B:2125
C412 220p
C425 4.7 6.3V :TA A
C422 10 6.3V :TA B
C418 0.01 F
R654 0
C421 47 4V :TA
R655 0 (C411)
CL487
R657 1k
C410 0.01 F
C416 0.01 F
R401 22k
C407 0.01 F
C409 0.033 B
C408 0.1 F
R404 1.5M
C420 0.047 B:2125
1.7M IR
CL485
C457 47 4V :TA C
R425 120
R426 1.5k
R428 2.2k
R427 330
C460 82p
C455 1 F:2125
CL486
Q400
2SA1576T106R
C449 0.0068 25V B
CL484
CL483
CL482
CL481
C439 47p
C498 1 :2125 F
C434 0.0022 B
C433 0.01 F
R415 8.2k
IC400
CXA-1488R-T4
Q407
DTC144EUT106
1.7M DEV
R495 220k
R472 330k
R478 220k
Q407
SWITCH
(H-3)
R497 330k


9
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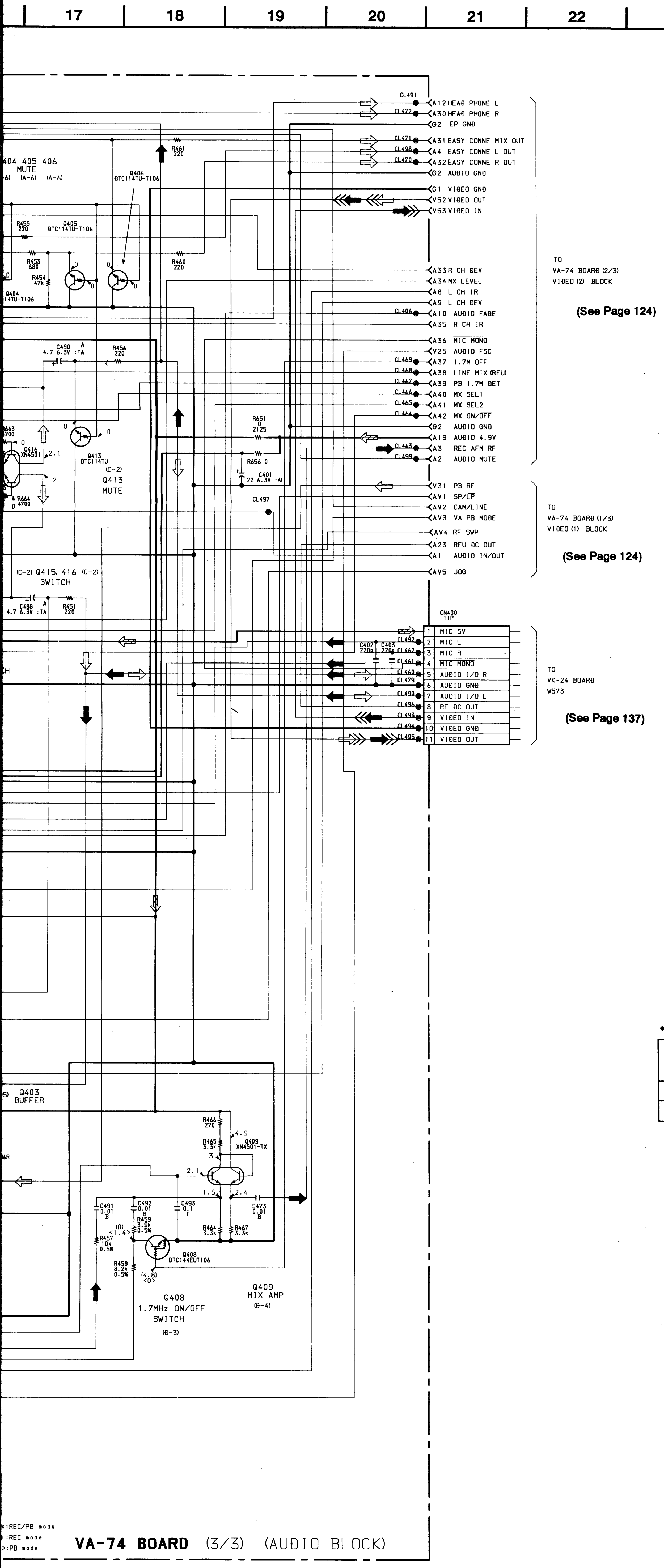
17
18
19
IC402
CXA1536Q-L-E1
MATRIX/OUTPUT SELECT
(G-1)
P.GEN
CK Q
D
DET
VREF
MATRIX ON/OFF CTL
MATRIX LOGIC CTL
MAIN (L)
SUB (R)
MAIN (L)
SUB (R)
COMP
DET
MX LEVEL
Vcc
IC402 CXA1536Q-L-E1
CL474
CL475
CL473
CL478
C470 1 F:2125
C472 22 4V :TA B
C476 1 F:2125
C478 1 F:2125
C481 22 4V :TA B
C469 10 6.3V :TA
C464 0.01 B
C468 10 4V :TA
C463 0.01 B
C462 0.01 B
C467 10 4V :TA
C466 0.01 B
C465 1 F:2125
C471 22 4V :TA B
C475 1 F:2125
C480 22 4V :TA B
C477 1 F:2125
C486 0.47 F:2125
R652 100k
R494 0
R470 120
C461 47 4V :AL
R430 1.5k
R659 47k
Q414 XN4401
R662 10k
R660 10k
R661 68k
Q414
MUTE BUFFER
(D-4)
IC400 (G-3)
CXA1488R-T4
AFM PROCESS
(R/L-R)
R425 120
R426 1.5k
R428 2.2k
R427 330
C460 82p
Q400 2SA1576T106R
Q400
BUFFER
(D-3)
Q404 405 406
MUTE
(A-6) (A-6) (A-6)
Q406 DTC114TU-T106
R461 220
R447 680
R455 220
Q405 DTC114TU-T106
R453 680
R454 47k
R450 47k
Q404 DTC114TU-T106
R460 220
R452 680
R456 220
C490 4.7 6.3V :TA
R487 220k
R446 220k
Q415 XN4312
R663 4700
Q416 XN4501
R664 4700
Q417 2SK1332
R658 0
Q413 DTC114TU
(C-2)
Q413
MUTE
R651 0 2125
R656 0
C401 22 6.3V :AL
CL497
R445 560
R448 120
(C-2) Q415, 416 (C-2)
SWITCH
R486 220k
C488 4.7 6.3V :TA
R451 220
Q417
LINE MIX SWITCH
(D-2)
(E-5) Q403
BUFFER
Q402
RF AMP
(A-5)
Q402 XN4501-TX
R436 2.2k
R440 22k
R432 3.3k
R435 2.2k
R439 18k
C483 0.01 F
C485 0.1 F
R442 1k
FL400
1.5M
C651 0.0068 B
R444 1k
Q403 2SC4081T106R
C487 0.01 B
Q401
RF AMP
(B-5)
C479 0.1 F
Q401 XN4501-TX
R434 3.3k
R438 22k
C482 0.01 F
R431 3.3k
R433 2.2k
R437 18k
C484 0.01 F
R441 1k
FL401
1.7M
C652 0.01 B
R443 1k
R449 1.5k
R466 270
R465 3.3k
Q409 XN4501-TX
C491 0.01 B
C492 0.01 B
C493 0.1 F
C473 0.01 B
R459 3.9k 0.5%
R457 10k 0.5%
R458 8.2k 0.5%
Q408 DTC144EUT106
R464 3.3k
R467 3.3k
Q408
1.7MHz ON/OFF
SWITCH
(B-3)
Q409
MIX AMP
(G-4)

no mark:REC/PB mode
( ):REC mode
< >:PB mode

VA-74 BOARD (3/3) (AUDIO BLO


17
18
19
20
21
22
23
24
25
26
27
CL491
A12 HEAD PHONE L
CL472
A30 HEAD PHONE R
G2 EP GND
CL471
A31 EASY CONNE MIX OUT
CL498
A4 EASY CONNE L OUT
CL470
A32 EASY CONNE R OUT
G2 AUDIO GND
G1 VIDEO GND
V52 VIDEO OUT
V53 VIDEO IN
A33 R CH DEV
A34 MX LEVEL
A8 L CH IR
A9 L CH DEV
CL406
A10 AUDIO FADE
A35 R CH IR
A36 MIC MONO
V25 AUDIO FSC
CL469
A37 1.7M OFF
CL468
A38 LINE MIX (RFU)
CL467
A39 PB 1.7M DET
CL466
A40 MX SEL1
CL465
A41 MX SEL2
CL464
A42 MX ON/OFF
G2 AUDIO GND
A19 AUDIO 4.9V
CL463
A3 REC AFM RF
CL499
A2 AUDIO MUTE
TO
VA-74 BOARD (2/3)
VIDEO (2) BLOCK
(See Page 124)
V31 PB RF
AV1 SP/LP
AV2 CAM/LINE
AV3 VA PB MODE
AV4 RF SWP
A23 RFU DC OUT
A1 AUDIO IN/OUT
AV5 JOG
TO
VA-74 BOARD (1/3)
VIDEO (1) BLOCK
(See Page 124)
CN400
11P
1 MIC 5V
2 MIC L
3 MIC R
4 MIC MONO
5 AUDIO I/O R
6 AUDIO GND
7 AUDIO I/O L
8 RF DC OUT
9 VIDEO IN
10 VIDEO GND
11 VIDEO OUT
CL492
CL462
CL461
CL460
CL479
CL490
CL496
CL493
CL494
CL495
C402 220p
C403 220p
TO
VK-24 BOARD
W573
(See Page 137)
404 405 406
MUTE
(A-6) (A-6)
R461 220
Q406 DTC114TU-T106
R455 220
Q405 DTC114TU-T106
R453 680
R454 47k
R460 220
Q404 DTC114TU-T106
C490 4.7 6.3V :TA
R456 220
R651 2125
R656 0
C401 22 6.3V :AL
CL497
R663 4700
Q416 XN4501
2.1
Q413 DTC114TU
(C-2)
Q413
MUTE
R664 4700
(C-2) Q415, 416 (C-2)
SWITCH
C488 4.7 6.3V :TA
R451 220
Q403
BUFFER
R466 270
R465 3.3k
4.9
Q409 XN4501-TX
2.1
1.5
2.4
C491 0.01 B
C492 0.01 B
R459 3.9k 0.5%
C493 0.1 F
C473 0.01 B
R464 3.3k
R467 3.3k
R457 10k 0.5%
R458 8.2k 0.5%
Q408 DTC144EUT106
(4.8) <0>
Q408
1.7MHz ON/OFF
SWITCH
(D-3)
Q409
MIX AMP
(G-4)
:REC/PB mode
:REC mode
:PB mode

VA-74 BOARD (3/3) (AUDIO BLOCK)

- **SIGNAL PATH**

	VIDEO SIGNAL			AUDIO SIGNAL
	CHROMA	Y	Y/CHROMA	
REC				➡
PB				⇨

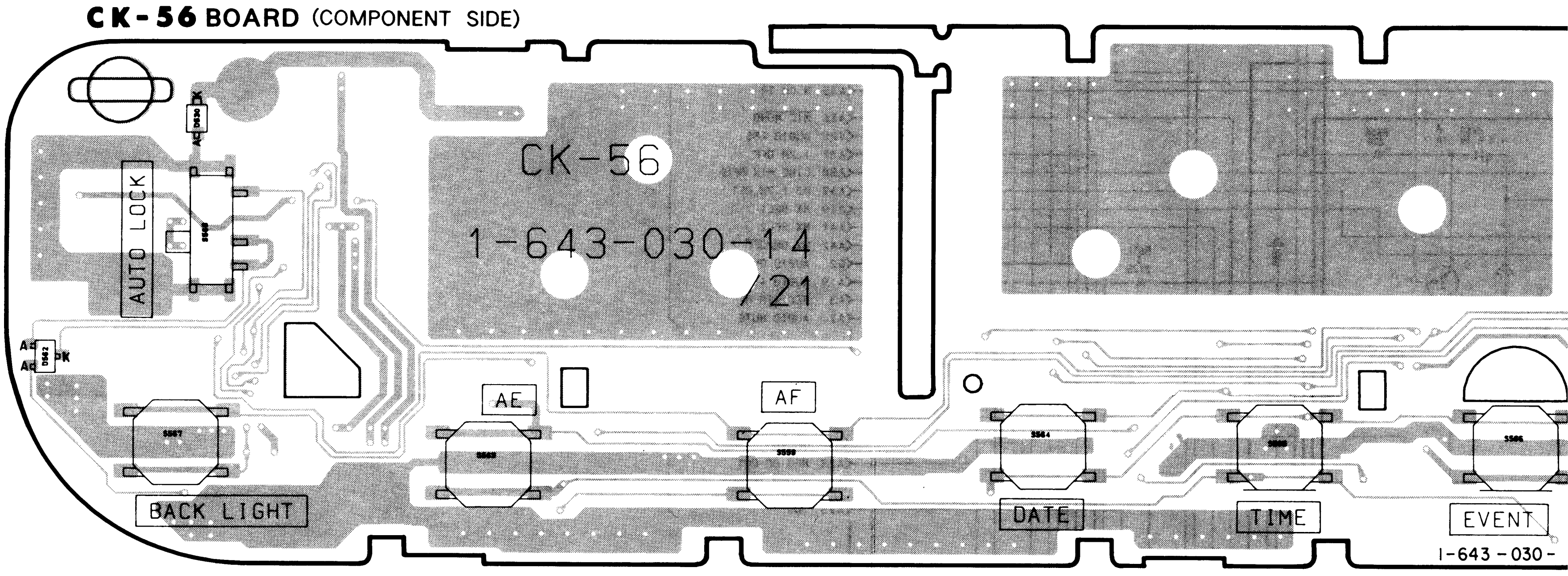
CK-56 (CAMERA CONTROL SWITCH), PK-32 (VTR/CAMERA SWITCH), DK-21 (RESET SWITCH), SW-201 (CAMERA START/STOP), VK-24 (VTR CONTROL SWITCH), MA-12

— Ref. No. MA-128 BOARD: 3000 series, VK-24 BOARD: 4000 series, PJ-47 BOARD: 5000 series, SW-201 BOARD: 6000 series, CK-56 BOARD: 7000 series, DK-21 BOARD: 8000 series, PK-32 BOARD: 9000 series, FK-54 BOARD: 10000 s

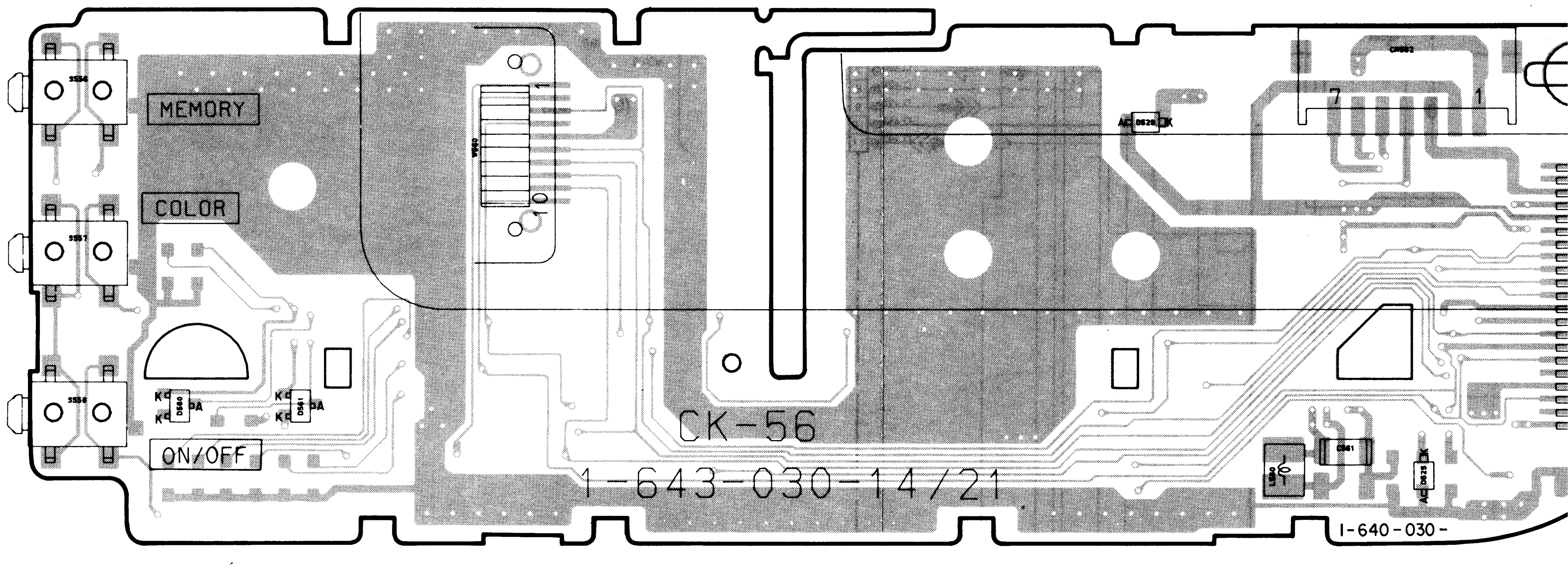
(DIODE)

D525	8-719-420-14	DIODE	MA8082-M
D529	8-719-404-46	DIODE	MA110
D530	8-719-404-46	DIODE	MA110
D560	8-719-820-05	DIODE	1SS181
D561	8-719-820-05	DIODE	1SS181
D562	8-719-404-35	DIODE	MA141WK

CK-56 BOARD (COMPONENT SIDE)


CK-56
1-643-030-14
/21
AUTO LOCK
AE
AF
BACK LIGHT
DATE
TIME
EVENT
1-643-030-

CK-56 BOARD (CONDUCTOR SIDE)


MEMORY
COLOR
ON/OFF
7
1
CK-56
1-643-030-14/21
1-640-030-

(DIODE)

D861	8-719-404-46	DIODE	MA110
D862	8-719-420-14	DIODE	MA8082-M
D863	8-719-420-14	DIODE	MA8082-M

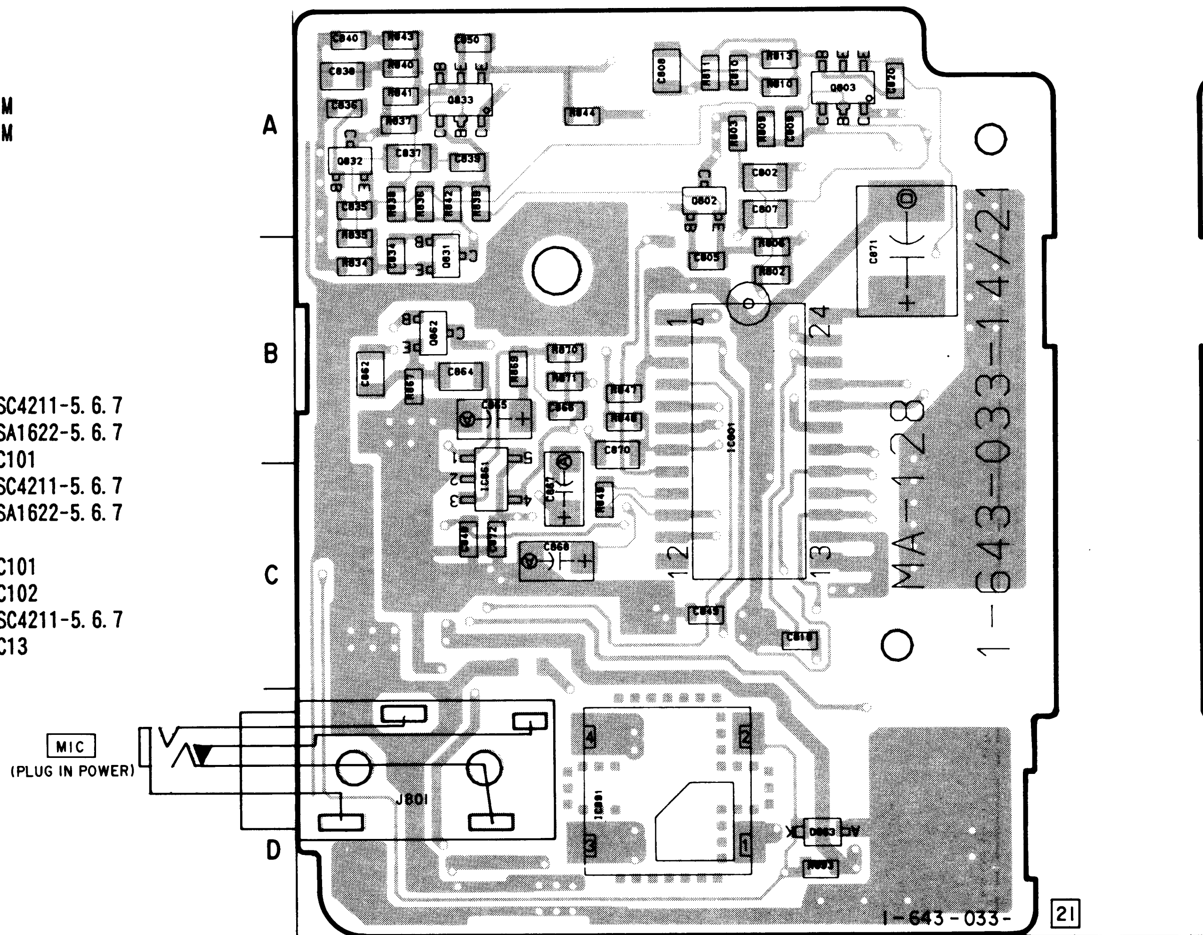
(IC)

IC801	8-759-823-41	IC	LA7470M
IC861	8-759-710-79	IC	NJM2107F
IC891	8-749-923-29	IC	RS-20E-T

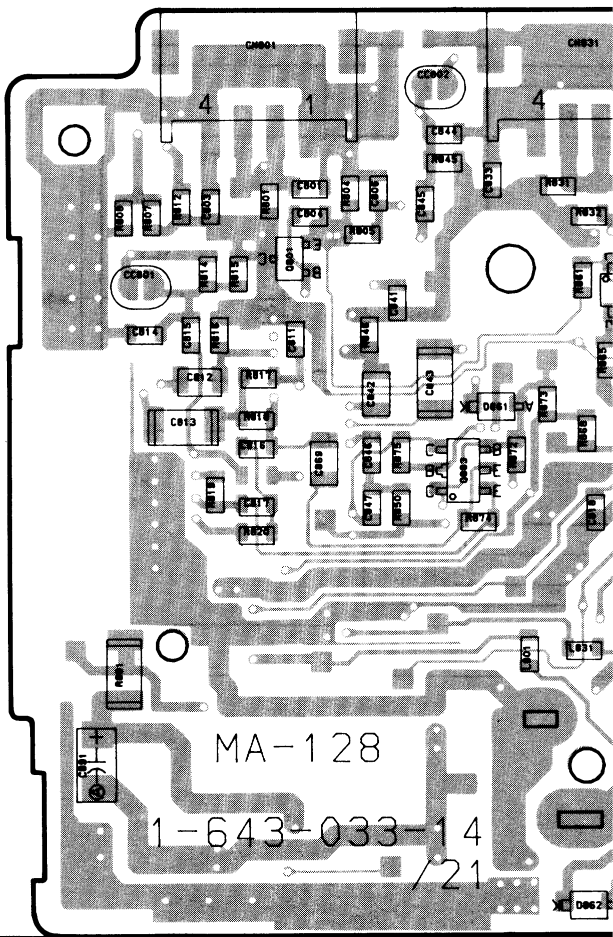
(TRANSISTOR)

Q801	8-729-822-97	TRANSISTOR	2SC4211-5. 6. 7
Q802	8-729-823-00	TRANSISTOR	2SA1622-5. 6. 7
Q803	8-729-822-48	TRANSISTOR	FC101
Q831	8-729-822-97	TRANSISTOR	2SC4211-5. 6. 7
Q832	8-729-823-00	TRANSISTOR	2SA1622-5. 6. 7
Q833	8-729-822-48	TRANSISTOR	FC101
Q861	8-729-822-94	TRANSISTOR	FC102
Q862	8-729-822-97	TRANSISTOR	2SC4211-5. 6. 7
Q863	8-729-010-80	TRANSISTOR	FC13

MA-128 BOARD (COMPONENT SIDE)


A
B
C
D
MA-128
1-643-033-14/21
24
13
12
1
J801
MIC
(PLUG IN POWER)
1-643-033-
21
1
2
3
4

MA-128 BOARD (CONDUCTOR SIDE)

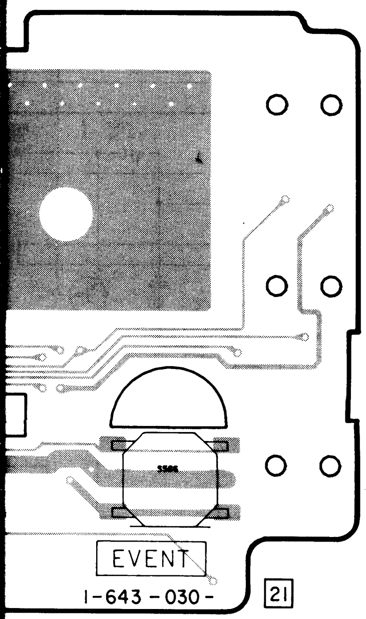

4
1
4
MA-128
1-643-033-14
/21
5
6
7

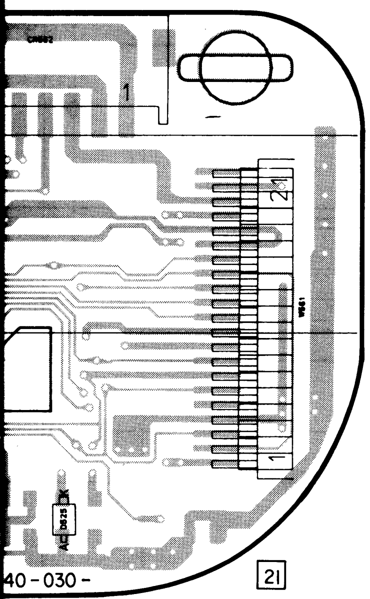
09

FK-54 BOARD: 10000 series —

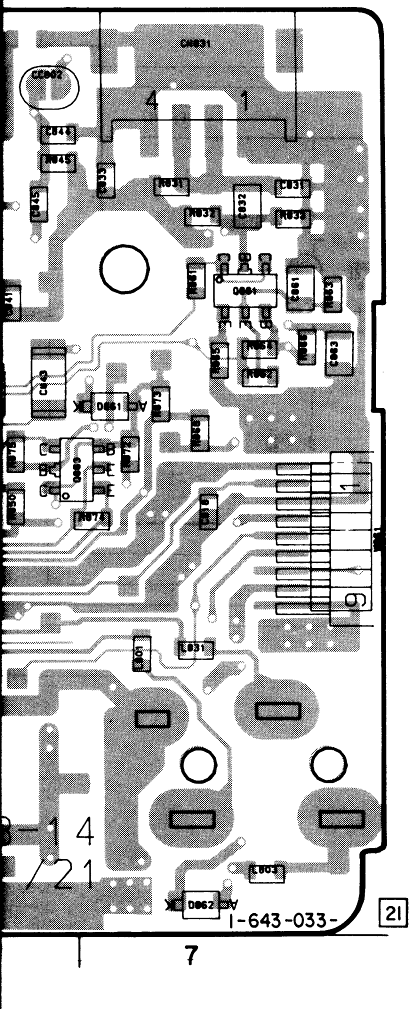
(DIODE)

D550	8-719-820-05	DIODE	1SS181
D551	8-719-420-14	DIODE	MA8082-M
D552	8-719-420-14	DIODE	MA8082-M
D553	8-719-420-14	DIODE	MA8082-M
D554	8-719-420-14	DIODE	MA8082-M

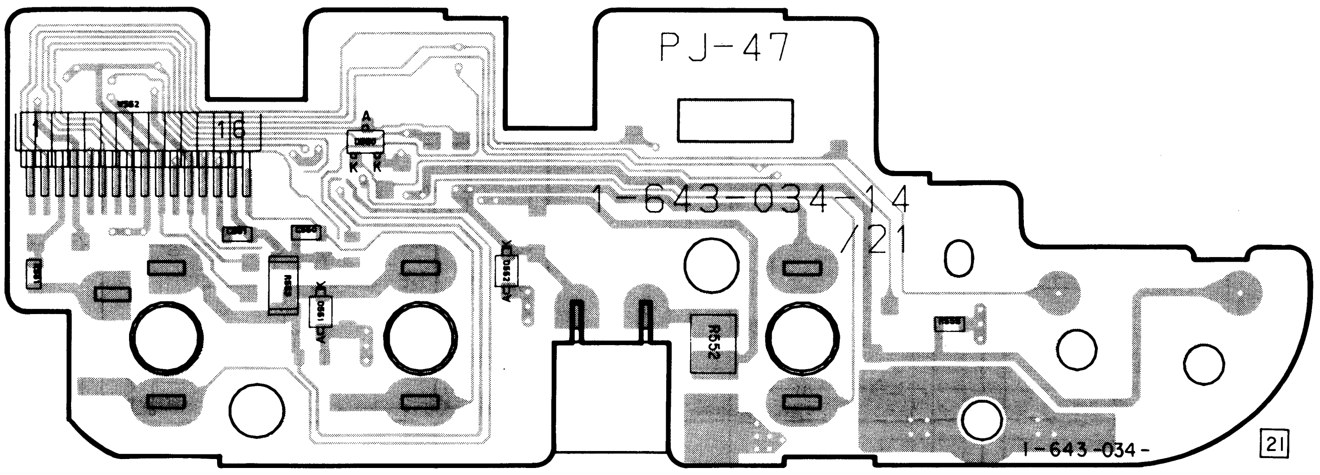

EVENT
1-643-030-
21



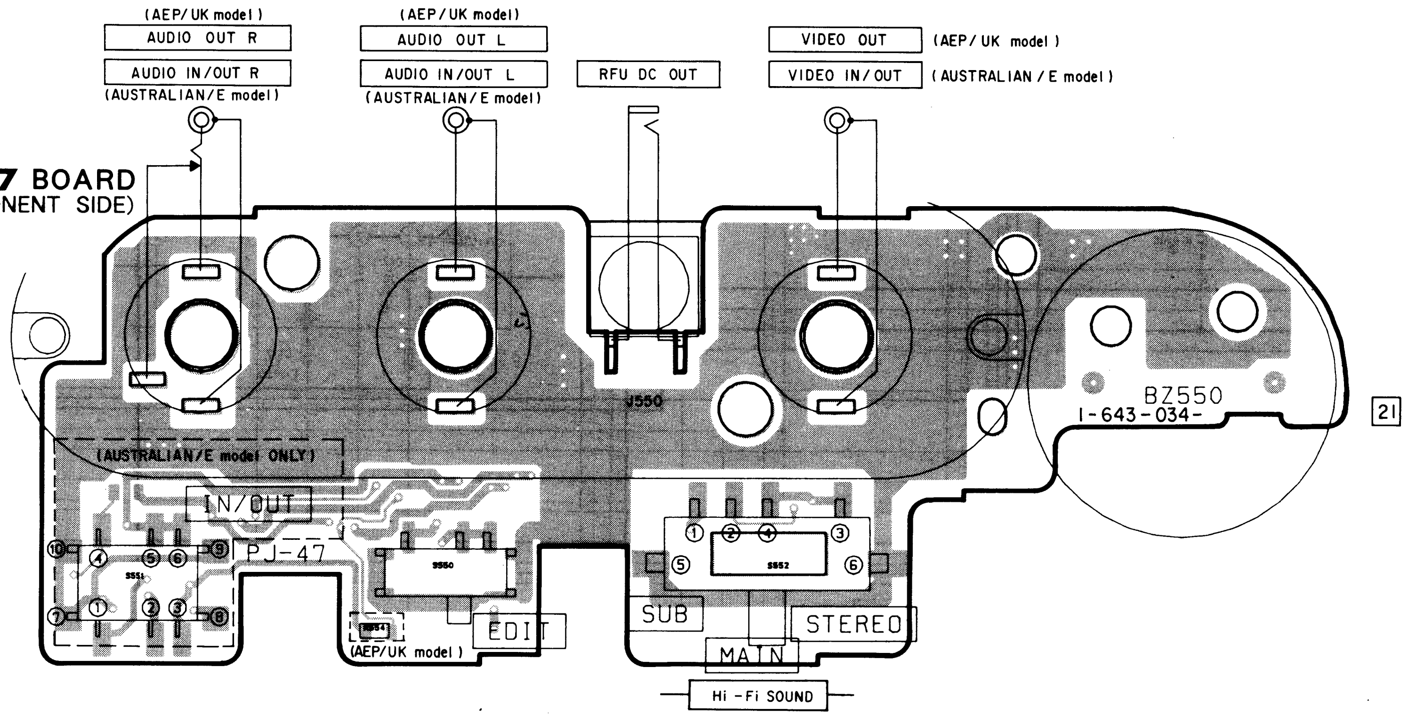
TOR SIDE)


4
1
-14
/21
1-643-033-
21
7

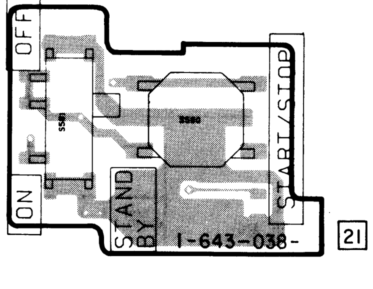
PJ-47 BOARD (CONDUCTOR SIDE)


PJ-47
16
1-643-034-14
/21
R552
1-643-034-
21

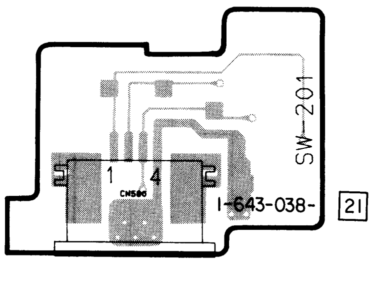
PJ-47 BOARD (COMPONENT SIDE)


(AEP/UK model)
AUDIO OUT R
AUDIO IN/OUT R
(AUSTRALIAN/E model)
(AEP/UK model)
AUDIO OUT L
AUDIO IN/OUT L
(AUSTRALIAN/E model)
RFU DC OUT
VIDEO OUT
(AEP/UK model)
VIDEO IN/OUT
(AUSTRALIAN/E model)
J550
BZ550
1-643-034-
21
(AUSTRALIAN/E model ONLY)
IN/OUT
PJ-47
S551
S550
S552
(AEP/UK model)
EDIT
SUB
MAIN
STEREO
Hi-Fi SOUND

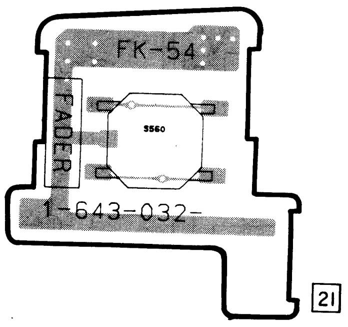
SW-201 BOARD (COMPONENT SIDE)


OFF
ON
S560
START/STOP
STAND BY
1-643-038-
21

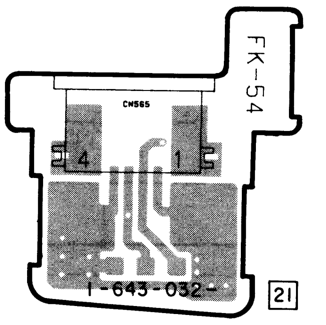
SW-201 BOARD (CONDUCTOR SIDE)


SW-201
1
4
CN560
1-643-038-
21

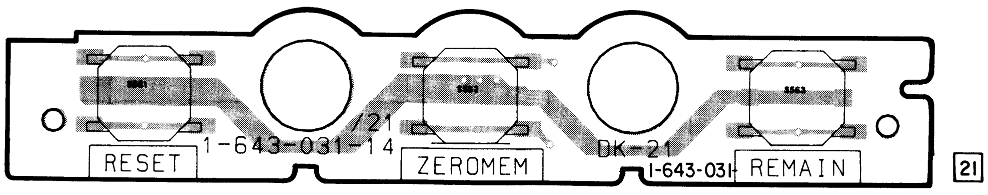
FK-54 BOARD (COMPONE


FK-54
FADER
S560
1-643-032-
21

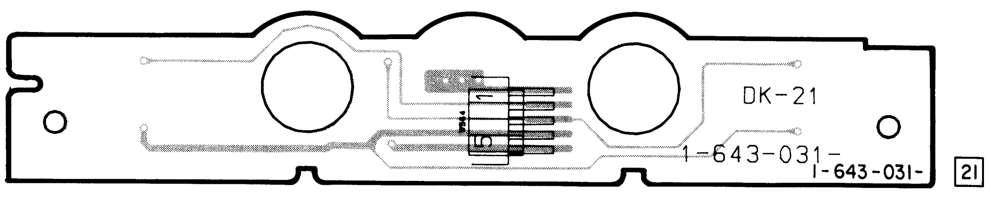
FK-54 BOARD (CONDUCTO

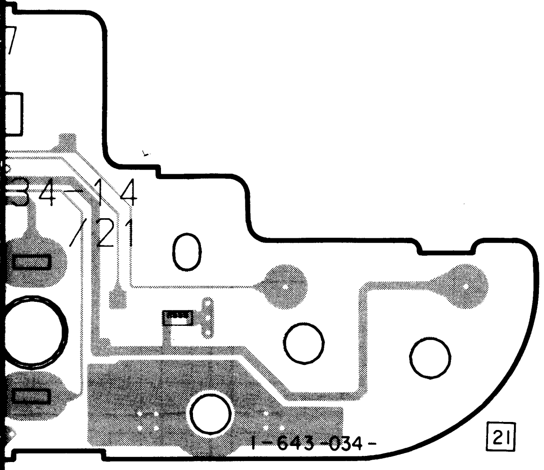

FK-54
CN565
4
1
1-643-032-
21

DK-21 BOARD (COMPONENT SIDE)

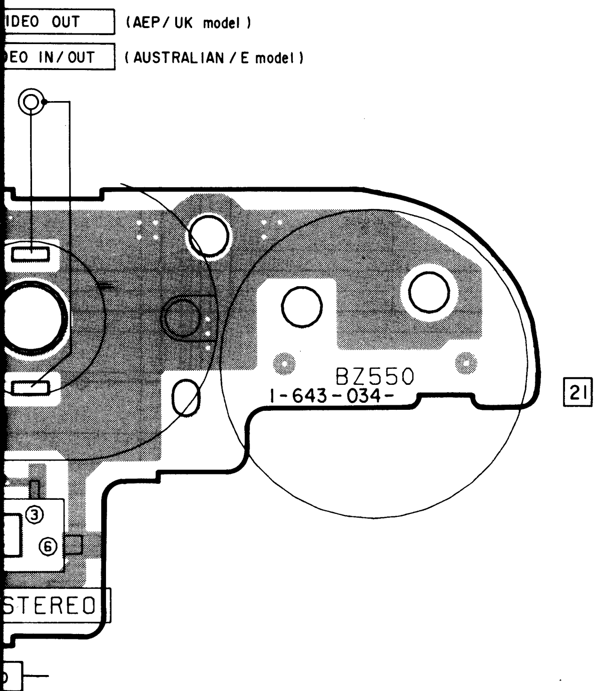

S561
S562
S563
RESET
1-643-031-14
/21
ZEROMEM
DK-21
1-643-031-
REMAIN
21

DK-21 BOARD (CONDUCTOR SIDE)


DK-21
1-643-031-
1-643-031-
21

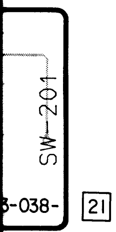


34-14
/21
1-643-034-
21



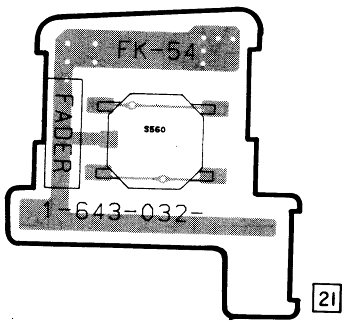
IDEO OUT
(AEP/UK model)
EO IN/OUT
(AUSTRALIAN/E model)
BZ550
1-643-034-
21
③
⑥
STEREO

RD (CONDUCTOR SIDE)



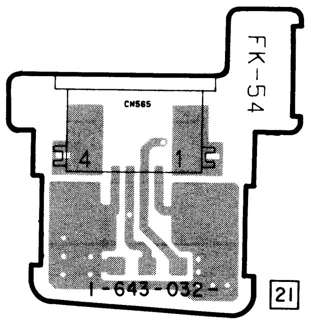
SW-201
-038-
21

FK-54 BOARD (COMPONENT SIDE)

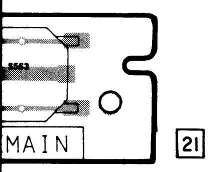


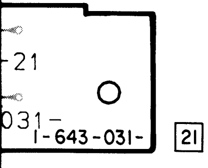
FK-54
FADER
S560
1-643-032-
21

FK-54 BOARD (CONDUCTOR SIDE)



FK-54
CN565
4
1
1-643-032-
21



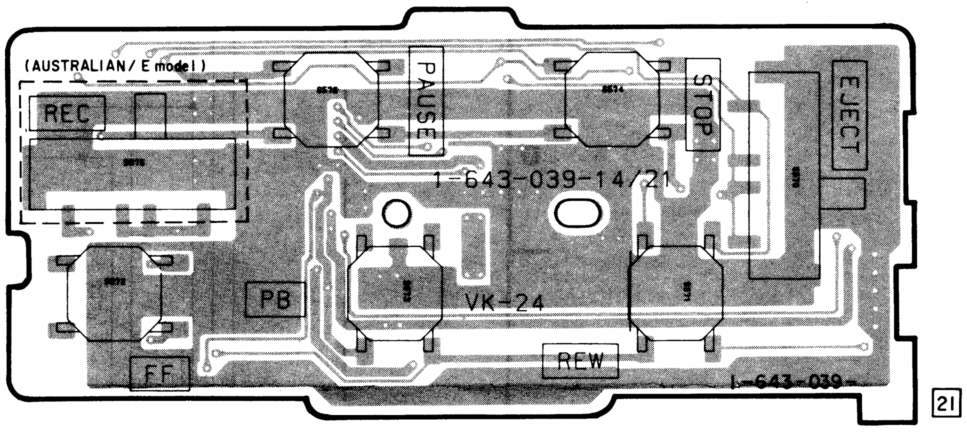


-21
031-
1-643-031-
21

(DIODE)

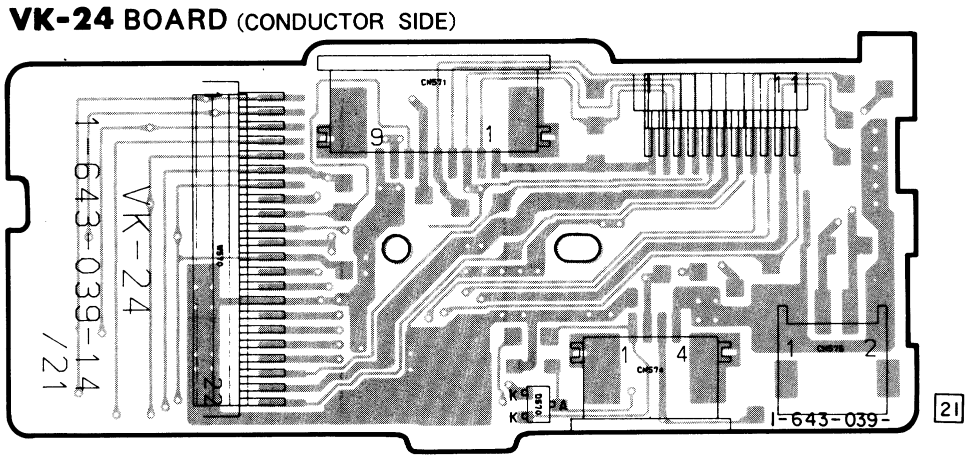
D570 8-719-820-05 DIODE 1SS181

VK-24 BOARD (COMPONENT SIDE)



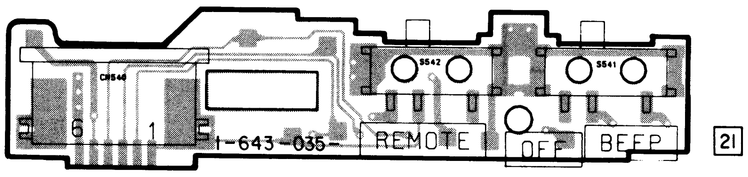
(AUSTRALIAN/E model)
REC
PAUSE
STOP
EJECT
1-643-039-14/21
PB
VK-24
FF
REW
1-643-039-
21

VK-24 BOARD (CONDUCTOR SIDE)



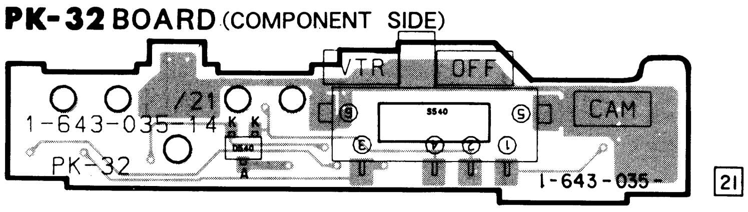
1-643-039-14/21
VK-24
CN571
9
1
22
1
4
CN574
1
2
CN575
K
K
1-643-039-
21

PK-32 BOARD (CONDUCTOR SIDE)



CN540
6
1
1-643-035-
S542
S541
REMOTE
OFF
BEEP
21

PK-32 BOARD (COMPONENT SIDE)



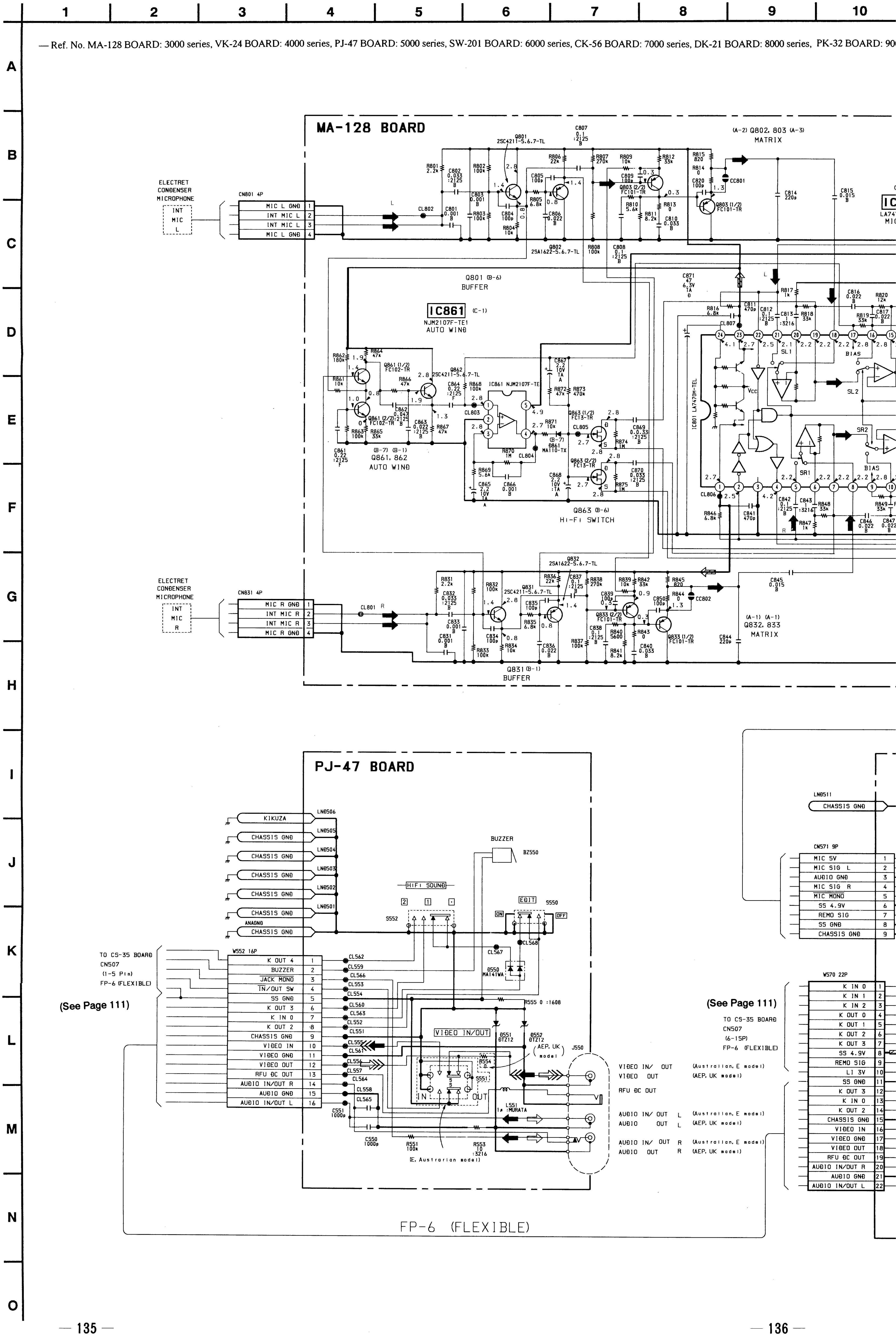
VTR
OFF
CAM
/21
1-643-035-14
PK-32
S540
D540
1-643-035-
21

(DIODE)

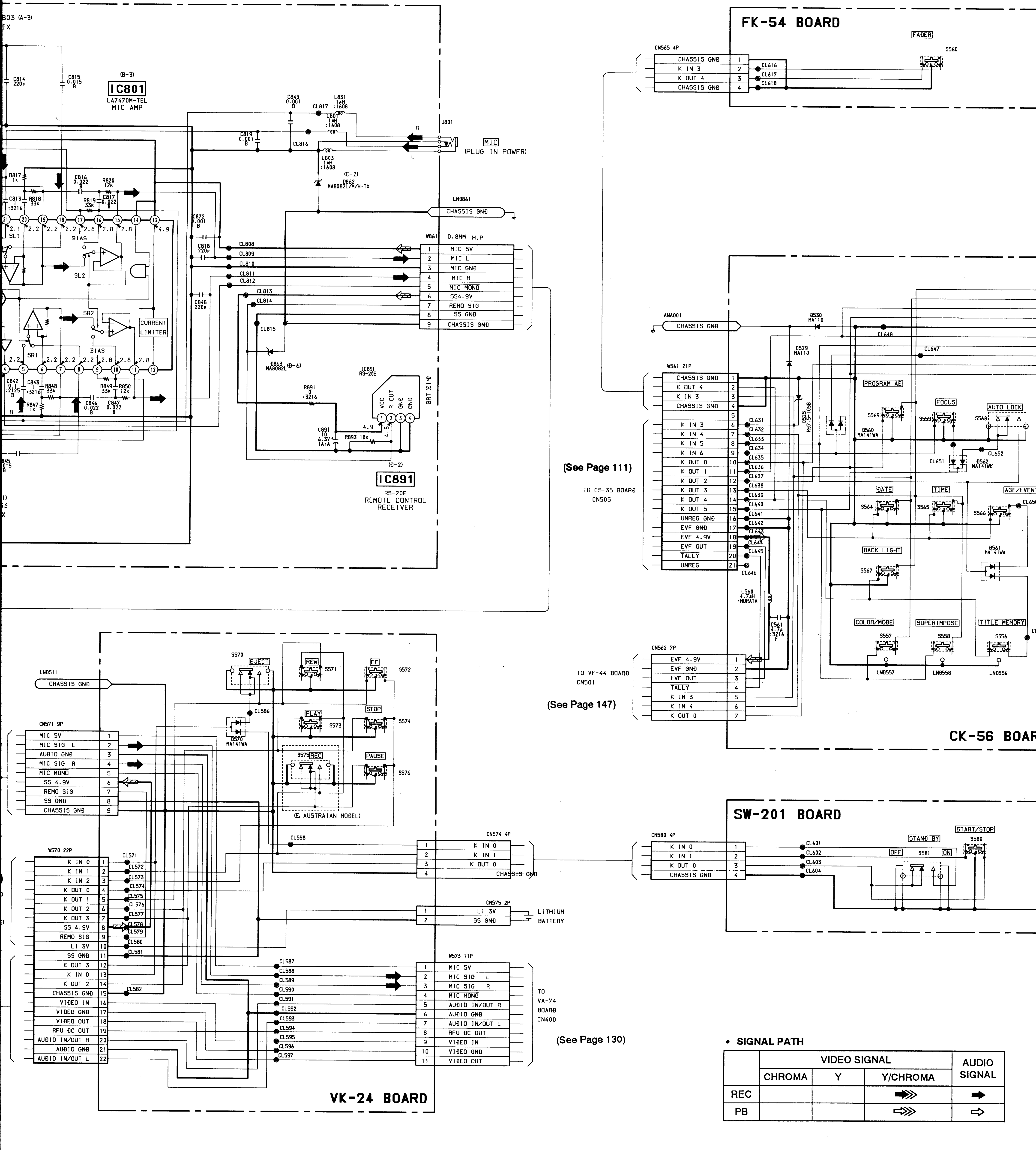
D540 8-719-820-05 DIODE 1SS181

CK-56 (CAMERA CONTROL SWITCH), PK-32 (VTR/CAMERA SWITCH), DK-21 (RESET SWITCH), SW-201 (CAMERA START/STOP), VK-24 (VTR CONTR

— Ref. No. MA-128 BOARD: 3000 series, VK-24 BOARD: 4000 series, PJ-47 BOARD: 5000 series, SW-201 BOARD: 6000 series, CK-56 BOARD: 7000 series, DK-21 BOARD: 8000 series, PK-32 BOARD: 90

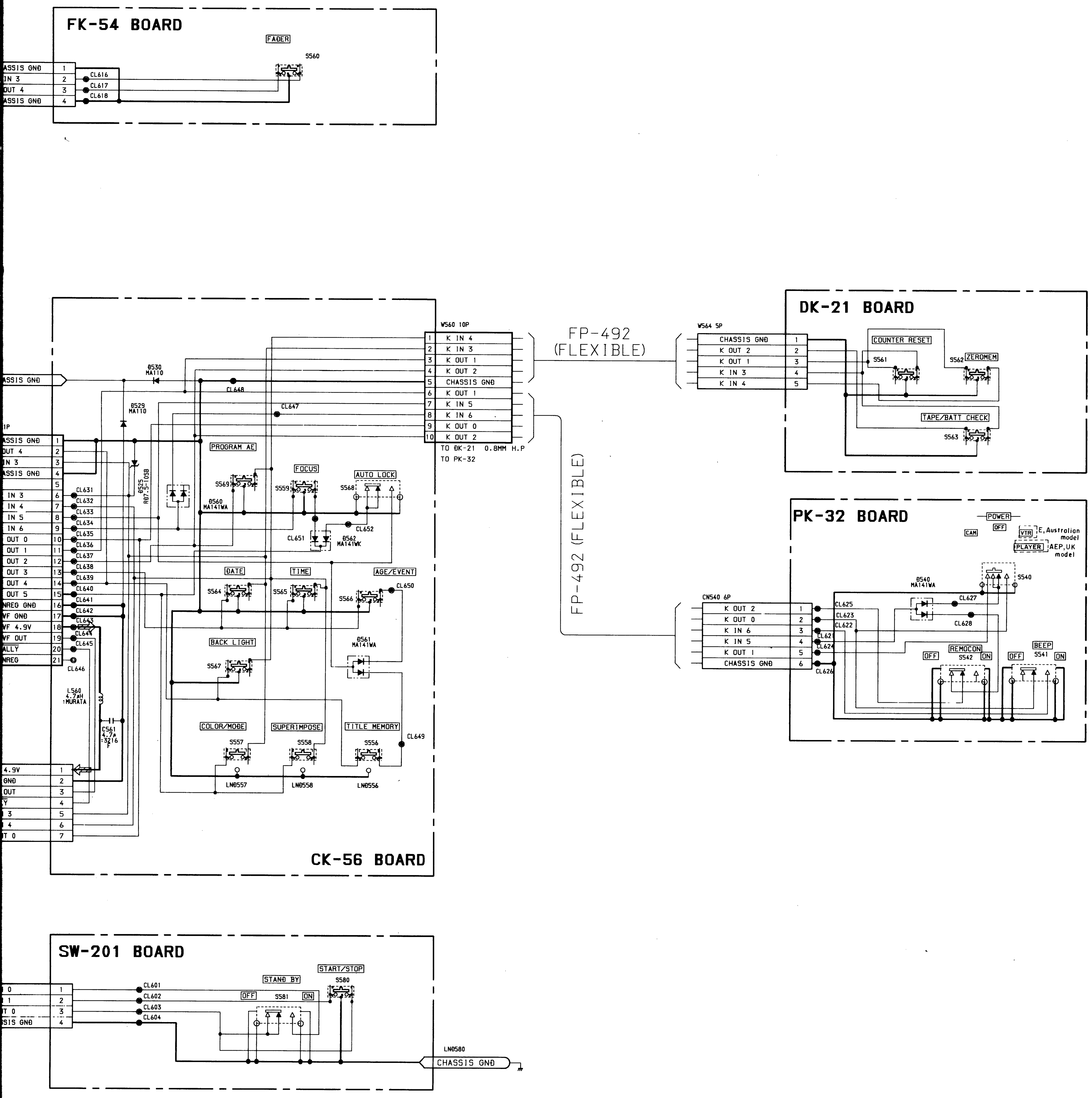

1
2
3
4
5
6
7
8
9
10
A
B
C
D
E
F
G
H
I
J
K
L
M
N
O
MA-128 BOARD
ELECTRET CONDENSER MICROPHONE
INT MIC L
CN801 4P
MIC L GND
INT MIC L
INT MIC L
MIC L GND
Q801 2SC4211-5.6.7-TL
Q802 2SA1622-5.6.7-TL
Q801 (B-6) BUFFER
IC861 (C-1)
NJM2107F-TE1
AUTO WIND
Q861, 862 AUTO WIND
Q863 (B-6) Hi-Fi SWITCH
(A-2) Q802, 803 (A-3) MATRIX
IC801 LA7470M-TEL
BIAS
SL1
SL2
SR1
SR2
ELECTRET CONDENSER MICROPHONE
INT MIC R
CN831 4P
MIC R GND
INT MIC R
INT MIC R
MIC R GND
Q831 (B-1) BUFFER
(A-1) (A-1) Q832, 833 MATRIX
PJ-47 BOARD
KIKUZA
CHASSIS GND
ANAGND
BUZZER
BZ550
HIFI SOUND
S552
EDIT
S550
ON
OFF
D550 MA141WA
TO CS-35 BOARD CN507 (1-5 Pin) FP-6 (FLEXIBLE)
(See Page 111)
W552 16P
K OUT 4
BUZZER
JACK MONO
IN/OUT SW
SS GND
K OUT 3
K IN 0
K OUT 2
CHASSIS GND
VIDEO IN
VIDEO GND
VIDEO OUT
RFU DC OUT
AUDIO IN/OUT R
AUDIO GND
AUDIO IN/OUT L
VIDEO IN/OUT
S551
D551 DTZ12
D552 DTZ12
(AEP, UK model)
J550
L551 1µ :MURATA
(E, Austrarian model)
VIDEO IN/ OUT (Austrarian, E model)
VIDEO OUT (AEP, UK model)
RFU DC OUT
AUDIO IN/ OUT L (Austrarian, E model)
AUDIO OUT L (AEP, UK model)
AUDIO IN/ OUT R (Austrarian, E model)
AUDIO OUT R (AEP, UK model)
FP-6 (FLEXIBLE)
LN0511
CHASSIS GND
CN571 9P
MIC 5V
MIC SIG L
AUDIO GND
MIC SIG R
MIC MONO
SS 4.9V
REMO SIG
SS GND
CHASSIS GND
(See Page 111)
TO CS-35 BOARD CN507 (6-15P) FP-6 (FLEXIBLE)
W570 22P
K IN 0
K IN 1
K IN 2
K OUT 0
K OUT 1
K OUT 2
K OUT 3
SS 4.9V
REMO SIG
LI 3V
SS GND
K OUT 3
K IN 0
K OUT 2
CHASSIS GND
VIDEO IN
VIDEO GND
VIDEO OUT
RFU DC OUT
AUDIO IN/OUT R
AUDIO GND
AUDIO IN/OUT L

00 series, PK-32 BOARD: 9000 series, FK-54 BOARD: 10000 series —


IC801
LA7470M-TEL
MIC AMP
CURRENT LIMITER
J801
MIC
(PLUG IN POWER)
LN0861
CHASSIS GND
W861 0.8MM H.P
MIC 5V
MIC L
MIC GND
MIC R
MIC MONO
SS4.9V
REMO SIG
SS GND
CHASSIS GND
IC891
RS-20E
REMOTE CONTROL
RECEIVER
FK-54 BOARD
FADER
S560
CN565 4P
CHASSIS GND
K IN 3
K OUT 4
CHASSIS GND
(See Page 111)
TO CS-35 BOARD
CN505
W561 21P
ANA001
PROGRAM AE
FOCUS
AUTO LOCK
DATE
TIME
AGE/EVENT
BACK LIGHT
COLOR/MODE
SUPERIMPOSE
TITLE MEMORY
CK-56 BOARD
CN562 7P
EVF 4.9V
EVF GND
EVF OUT
TALLY
K IN 3
K IN 4
K OUT 0
TO VF-44 BOARD
CN501
(See Page 147)
SW-201 BOARD
START/STOP
STAND BY
OFF
ON
S580
S581
CN580 4P
K IN 0
K IN 1
K OUT 0
CHASSIS GND
VK-24 BOARD
EJECT
REW
FF
PLAY
STOP
REC
PAUSE
(E, AUSTRALIAN MODEL)
LN0511
CHASSIS GND
CN571 9P
W570 22P
CN574 4P
CN575 2P
LI 3V
SS GND
LITHIUM
BATTERY
W573 11P
MIC 5V
MIC SIG L
MIC SIG R
MIC MONO
AUDIO IN/OUT R
AUDIO GND
AUDIO IN/OUT L
RFU DC OUT
VIDEO IN
VIDEO GND
VIDEO OUT
TO
VA-74
BOARD
CN400
(See Page 130)

• **SIGNAL PATH**

	VIDEO SIGNAL			AUDIO SIGNAL
	CHROMA	Y	Y/CHROMA	
REC			➡	➡
PB			⇨	⇨


FK-54 BOARD
FADER
S560
CL616
CL617
CL618
CK-56 BOARD
W560 10P
K IN 4
K IN 3
K OUT 1
K OUT 2
CHASSIS GND
K OUT 1
K IN 5
K IN 6
K OUT 0
K OUT 2
TO DK-21 0.8MM H.P
TO PK-32
FP-492 (FLEXIBLE)
FP-492 (FLEXIBLE)
D530 MA110
D529 MA110
D525 RD7.5-1058
CL648
CL647
PROGRAM AE
FOCUS
AUTO LOCK
S569
S559
S568
D560 MA141WA
CL651
CL652
D562 MA141WK
DATE
TIME
AGE/EVENT
S564
S565
S566
CL650
BACK LIGHT
S567
D561 MA141WA
COLOR/MODE
SUPERIMPOSE
TITLE MEMORY
S557
S558
S556
CL649
LND557
LND558
LND556
CL631 CL632 CL633 CL634 CL635 CL636 CL637 CL638 CL639 CL640 CL641 CL642 CL643 CL644 CL645 CL646
L560 4.7μH :MURATA
C561 4.7μ :3216 F
DK-21 BOARD
W564 5P
CHASSIS GND
K OUT 2
K OUT 1
K IN 3
K IN 4
COUNTER RESET
S561
S562
ZEROMEM
TAPE/BATT CHECK
S563
PK-32 BOARD
POWER
CAM
OFF
VTR E, Australian model
PLAYER AEP, UK model
S540
D540 MA141WA
CN540 6P
K OUT 2
K OUT 0
K IN 6
K IN 5
K OUT 1
CHASSIS GND
CL625 CL623 CL622 CL621 CL624 CL626
CL627
CL628
REMOCON
OFF
S542
ON
BEEP
OFF
S541
ON
SW-201 BOARD
START/STOP
STAND BY
S580
OFF
S581
ON
CL601
CL602
CL603
CL604
LND580
CHASSIS GND

- **SIGNAL PATH**

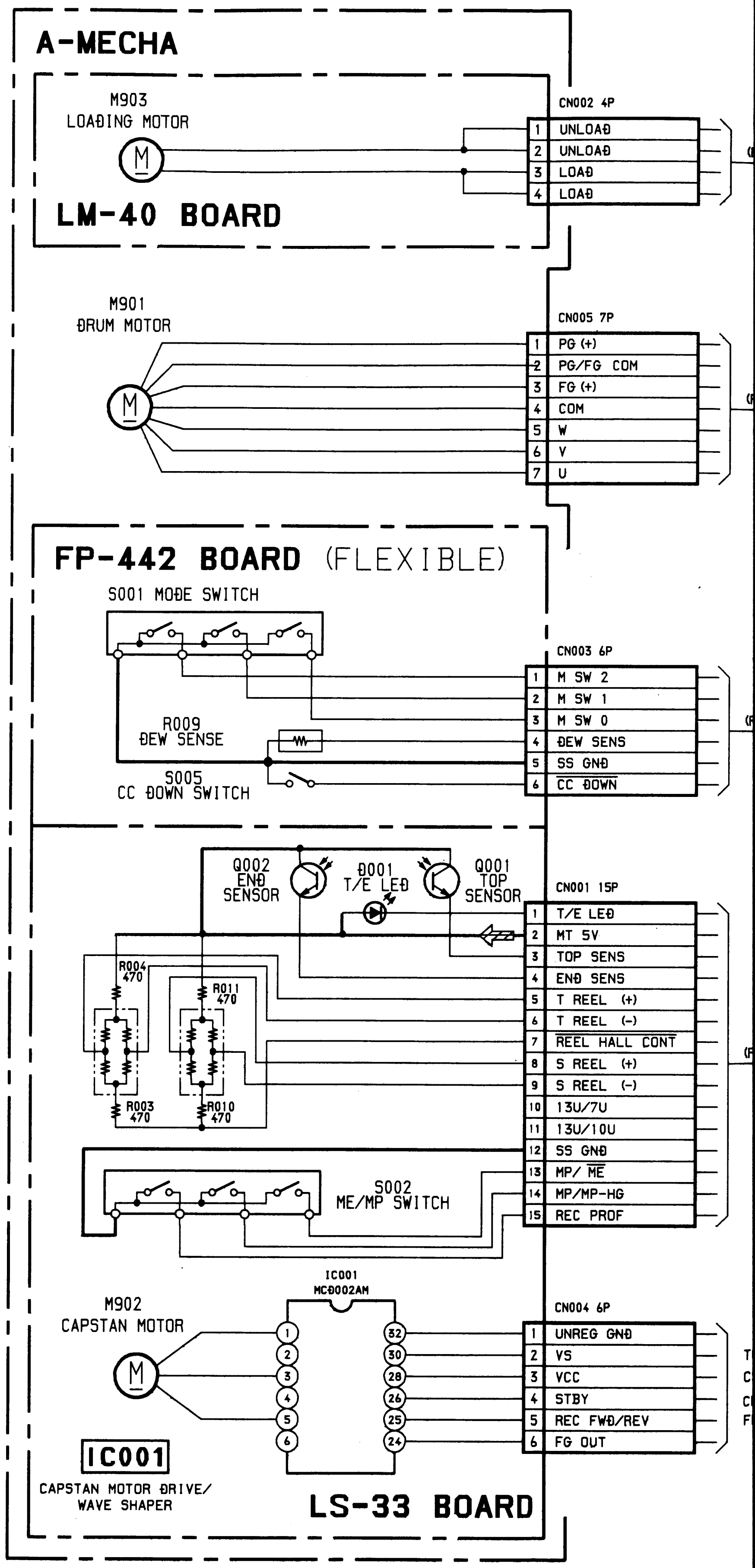
	VIDEO SIGNAL			AUDIO SIGNAL
	CHROMA	Y	Y/CHROMA	
REC			➡≫	➡
PB			⇨≫	⇨

SL-25 (MECH CONTROL) SCHEMATIC DIAGRAM

1	2	3	4	5	6	7	8	9

— Ref. No. SL-25 BOARD: 3000 series —

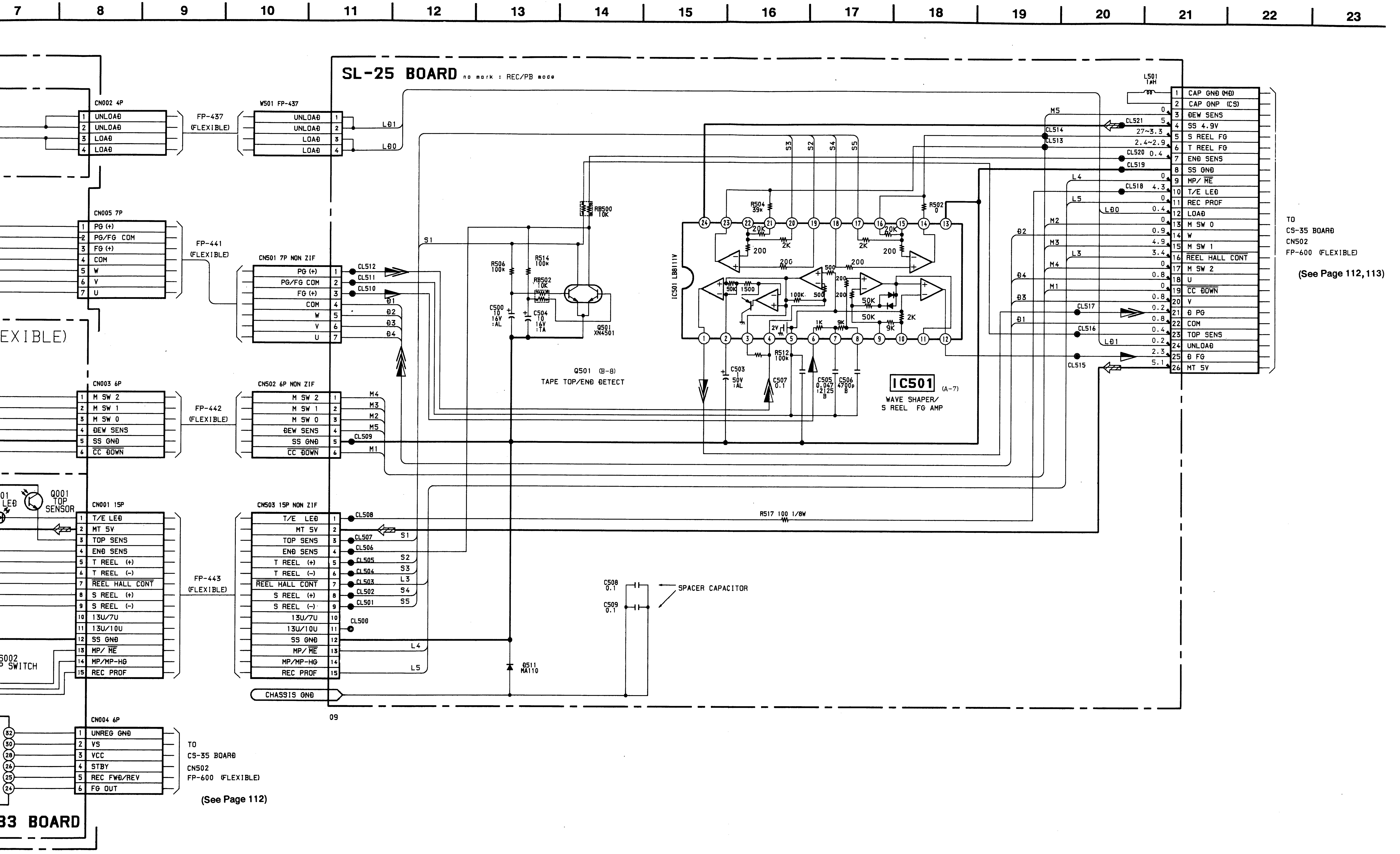
A
B
C
D
E
F
G
H
I
J



A-MECHA
M903
LOADING MOTOR
M
LM-40 BOARD
CN002 4P
1 UNLOAD
2 UNLOAD
3 LOAD
4 LOAD
M901
DRUM MOTOR
M
CN005 7P
1 PG (+)
2 PG/FG COM
3 FG (+)
4 COM
5 W
6 V
7 U
FP-442 BOARD (FLEXIBLE)
S001 MODE SWITCH
R009
DEW SENSE
S005
CC DOWN SWITCH
CN003 6P
1 M SW 2
2 M SW 1
3 M SW 0
4 DEW SENS
5 SS GND
6 CC DOWN
Q002
END
SENSOR
D001
T/E LED
Q001
TOP
SENSOR
R004
470
R011
470
R003
470
R010
470
CN001 15P
1 T/E LED
2 MT 5V
3 TOP SENS
4 END SENS
5 T REEL (+)
6 T REEL (−)
7 REEL HALL CONT
8 S REEL (+)
9 S REEL (−)
10 13V/7V
11 13V/10V
12 SS GND
13 MP/ ME
14 MP/MP-HG
15 REC PROF
S002
ME/MP SWITCH
M902
CAPSTAN MOTOR
M
IC001
MC6002AM
1 2 3 4 5 6
32 30 28 26 25 24
IC001
CAPSTAN MOTOR DRIVE/
WAVE SHAPER
LS-33 BOARD
CN004 6P
1 UNREG GND
2 VS
3 VCC
4 STBY
5 REC FWD/REV
6 FG OUT

- **SIGNAL PATH**

	REC	REC/PB	PB
Drum speed servo		▷	
Drum phase servo		▷〉	
Drum servo (speed and phase)		▷〉〉	
Capstan speed servo			
Capstan phase servo	➤	➤〉〉	⊃〉
Capstan servo (speed and phase)		➤〉	
Ref. signal			


7
8
9
10
11
12
13
14
15
16
17
18
19
20
21
22
23
SL-25 BOARD
no mark : REC/PB mode
CN002 4P
1 UNLOAD
2 UNLOAD
3 LOAD
4 LOAD
FP-437 (FLEXIBLE)
W501 FP-437
UNLOAD 1
UNLOAD 2
LOAD 3
LOAD 4
LD1
LD0
CN005 7P
1 PG (+)
2 PG/FG COM
3 FG (+)
4 COM
5 W
6 V
7 U
FP-441 (FLEXIBLE)
CN501 7P NON ZIF
PG (+) 1
PG/FG COM 2
FG (+) 3
COM 4
W 5
V 6
U 7
CL512
CL511
CL510
Ø1
Ø2
Ø3
Ø4
S1
EXIBLE)
CN003 6P
1 M SW 2
2 M SW 1
3 M SW 0
4 DEW SENS
5 SS GND
6 CC DOWN
FP-442 (FLEXIBLE)
CN502 6P NON ZIF
M SW 2 1
M SW 1 2
M SW 0 3
DEW SENS 4
SS GND 5
CC DOWN 6
M4
M3
M2
M5
CL509
M1
Q001 TOP SENSOR
LED
CN001 15P
1 T/E LED
2 MT 5V
3 TOP SENS
4 END SENS
5 T REEL (+)
6 T REEL (-)
7 REEL HALL CONT
8 S REEL (+)
9 S REEL (-)
10 13U/7U
11 13U/10U
12 SS GND
13 MP/ME
14 MP/MP-HG
15 REC PROF
FP-443 (FLEXIBLE)
CN503 15P NON ZIF
T/E LED 1
MT 5V 2
TOP SENS 3
END SENS 4
T REEL (+) 5
T REEL (-) 6
REEL HALL CONT 7
S REEL (+) 8
S REEL (-) 9
13U/7U 10
13U/10U 11
SS GND 12
MP/ME 13
MP/MP-HG 14
REC PROF 15
CL508
CL507
CL506
CL505
CL504
CL503
CL502
CL501
CL500
S1
S2
S3
L3
S4
S5
L4
L5
S002 P SWITCH
CHASSIS GND
09
CN004 6P
1 UNREG GND
2 VS
3 VCC
4 STBY
5 REC FWD/REV
6 FG OUT
32
30
28
26
25
24
TO
CS-35 BOARD
CN502
FP-600 (FLEXIBLE)
(See Page 112)
33 BOARD
RB500 10K
R506 100k
R514 100k
RB502 10K
C500 10 16V :AL
C504 10 16V :TA
Q501 XN4501
Q501 (B-8)
TAPE TOP/END DETECT
D511 MA110
C508 0.1
C509 0.1
SPACER CAPACITOR
R517 100 1/8W
S3
S2
S4
S5
R504 39k
R502 0
IC501 LB8111V
20K
2K
200
200
2K
20K
200
50K
1500
200
500
200
100K
500
50K
50K
2K
9K
2V
1K
9K
R512 100k
C503 1 50V :AL
C507 0.1
C505 0.047 :2125 B
C506 4700p B
IC501 (A-7)
WAVE SHAPER/
S REEL FG AMP
L501 1μH
M5
CL521
CL514
CL513
CL520
CL519
L4
CL518
L5
LD0
M2
D2
M3
L3
M4
D4
M1
D3
CL517
D1
CL516
LD1
CL515
0
5
27~3.3
2.4~2.9
0.4
0
4.3
0
0.4
0
0.9
4.9
3.4
0
0.8
0
0.8
0.2
0.8
0.4
0.2
2.3
5.1
1 CAP GND (MD)
2 CAP GNP (CS)
3 DEW SENS
4 SS 4.9V
5 S REEL FG
6 T REEL FG
7 END SENS
8 SS GND
9 MP/ME
10 T/E LED
11 REC PROF
12 LOAD
13 M SW 0
14 W
15 M SW 1
16 REEL HALL CONT
17 M SW 2
18 U
19 CC DOWN
20 V
21 D PG
22 COM
23 TOP SENS
24 UNLOAD
25 D FG
26 MT 5V
TO
CS-35 BOARD
CN502
FP-600 (FLEXIBLE)
(See Page 112,113)

SL-25 (MECH CONTROL) PRINTED WIRING BOARD

— Ref. No. SL-25 BOARD: 3000 series —

〈 DIODE 〉

D511 8-719-404-46 DIODE MA110

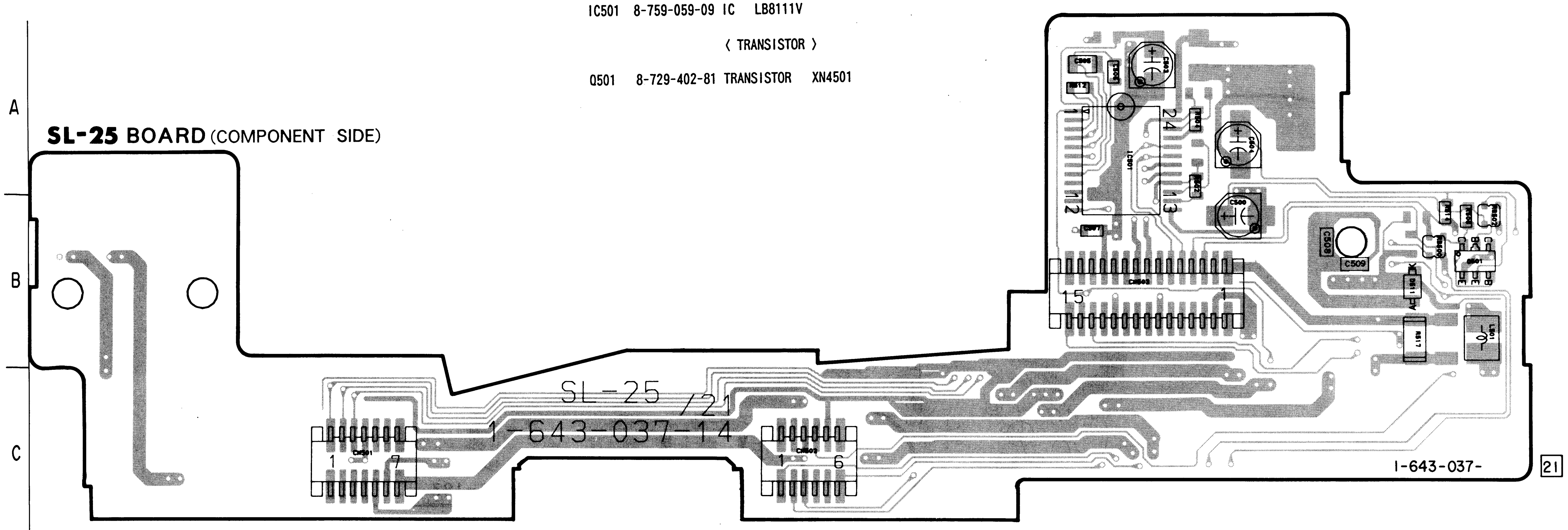
〈 IC 〉

IC501 8-759-059-09 IC LB8111V

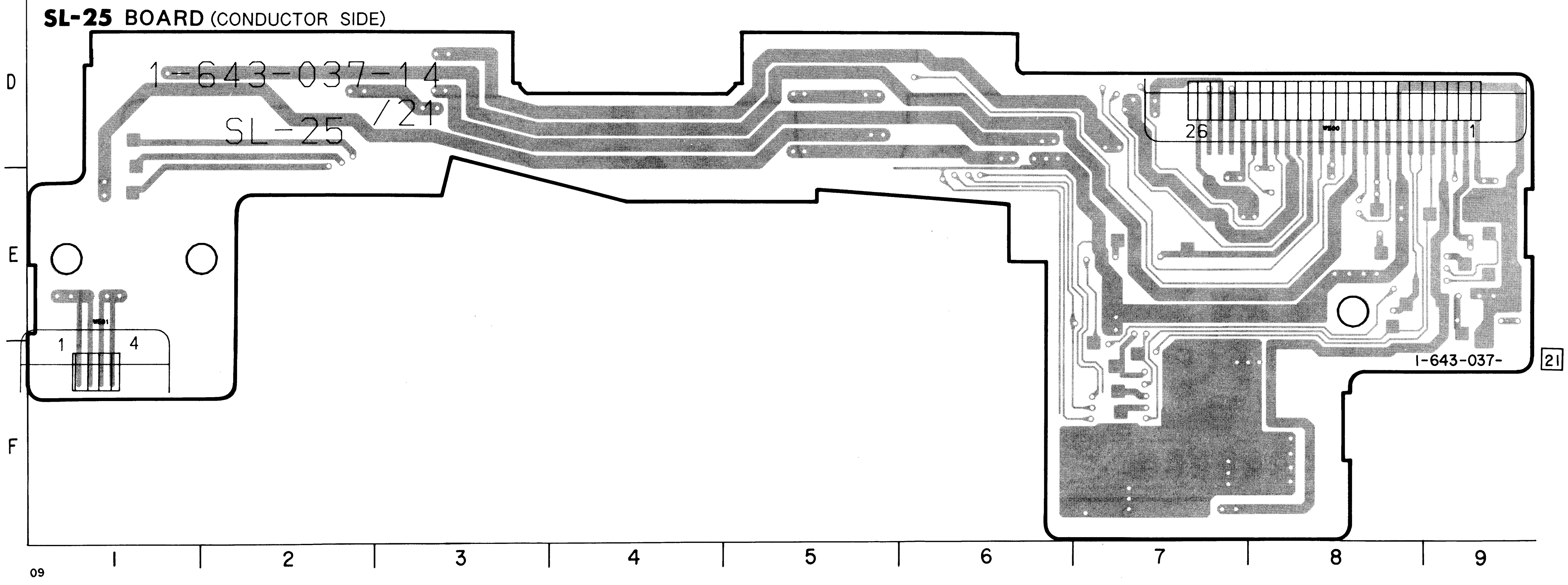
〈 TRANSISTOR 〉

Q501 8-729-402-81 TRANSISTOR XN4501

SL-25 BOARD (COMPONENT SIDE)


A
B
C
SL-25 /21
1-643-037-14
CN501
1
7
CN502
1
6
IC501
1
12
24
13
C509
CN503
15
1
1-643-037-
21

SL-25 BOARD (CONDUCTOR SIDE)


D
E
F
1-643-037-14
SL-25 /21
26
1
1
4
1-643-037-
21
09
1
2
3
4
5
6
7
8
9

VF-44 (VIEW FINDER) PRINTED WIRING BOARD

— Ref. No. VF-44 BOARD: 2000 series —

〈 DIODE 〉

D501	8-719-024-87	DIODE	LN1261CAL
D502	8-719-024-87	DIODE	LN1261CAL
D503	8-719-400-20	DIODE	MA152WA

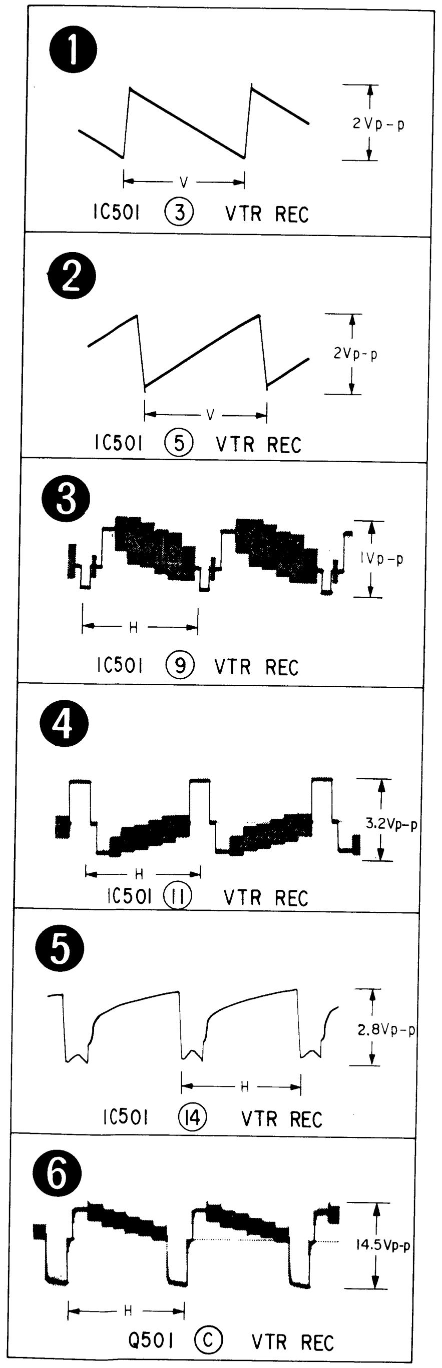
〈 IC 〉

IC501	8-759-420-01	IC	AN2512S

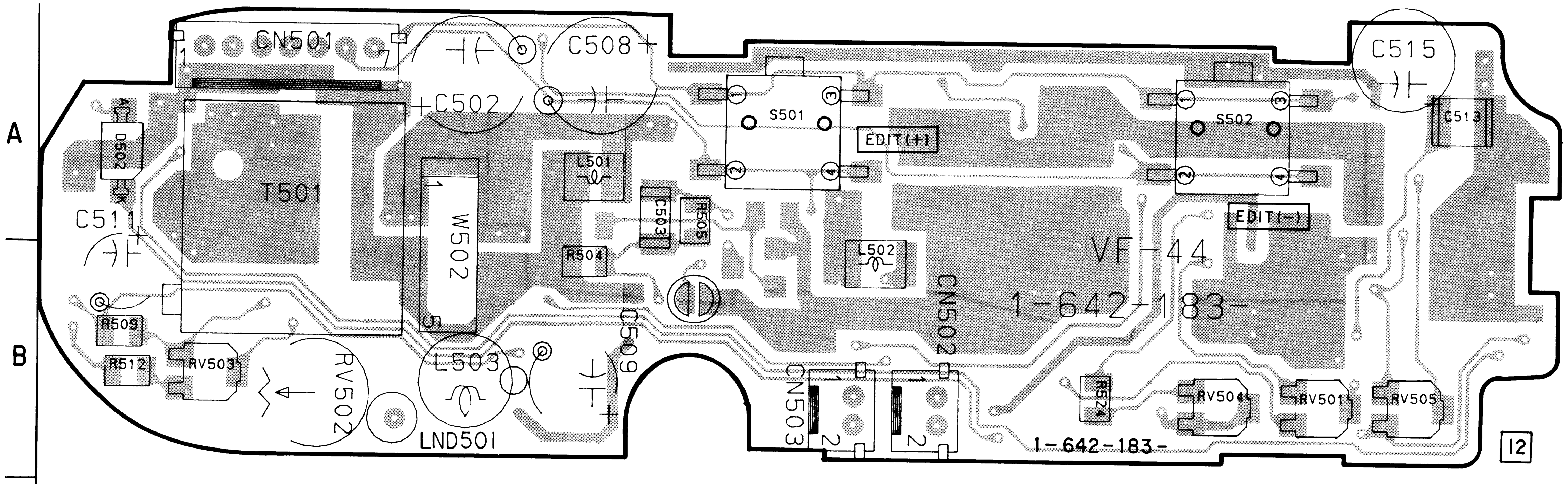
〈 TRANSISTOR 〉

Q501	8-729-216-31	TRANSISTOR	2SA1163-G
Q503	8-729-106-68	TRANSISTOR	2SD1615A-GP

VF-44 BOARD

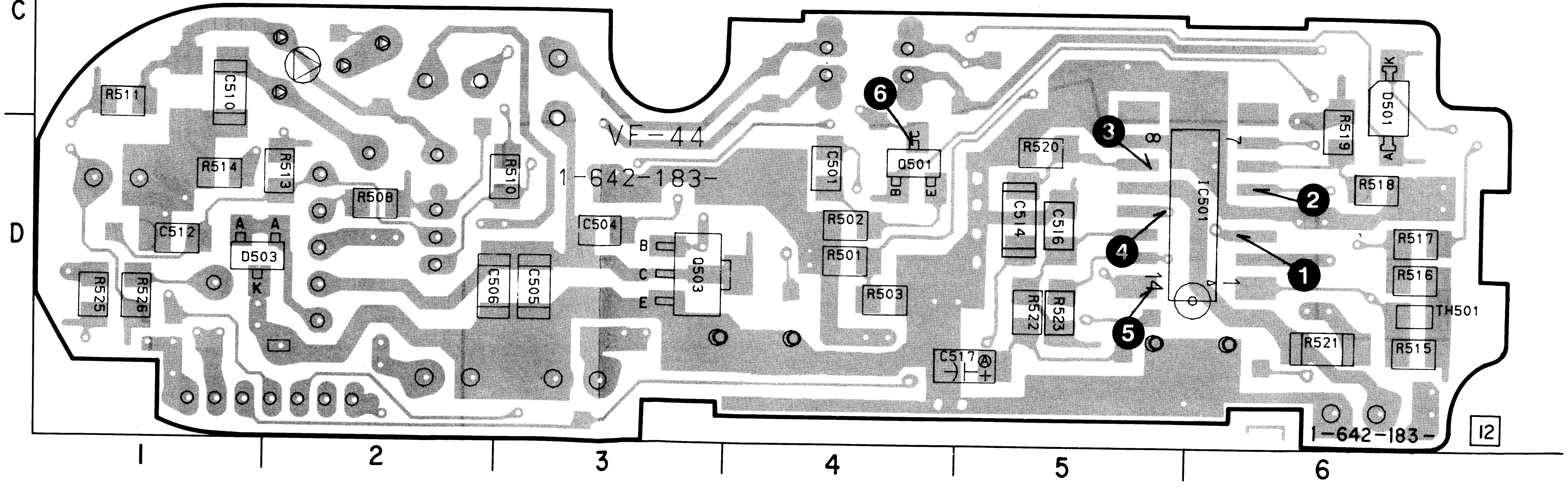


VF-44 (COMPONENT SIDE)



A
B
CN501
1
7
C508
C502
C515
C513
D502
A
K
T501
W502
1
5
L501
C503
R505
S501
EDIT(+)
S502
EDIT(−)
C511
R504
L502
CN502
VF-44
1-642-183-
R509
R512
RV503
RV502
L503
LND501
C509
CN503
2
R524
RV504
RV501
RV505
1-642-183-
12

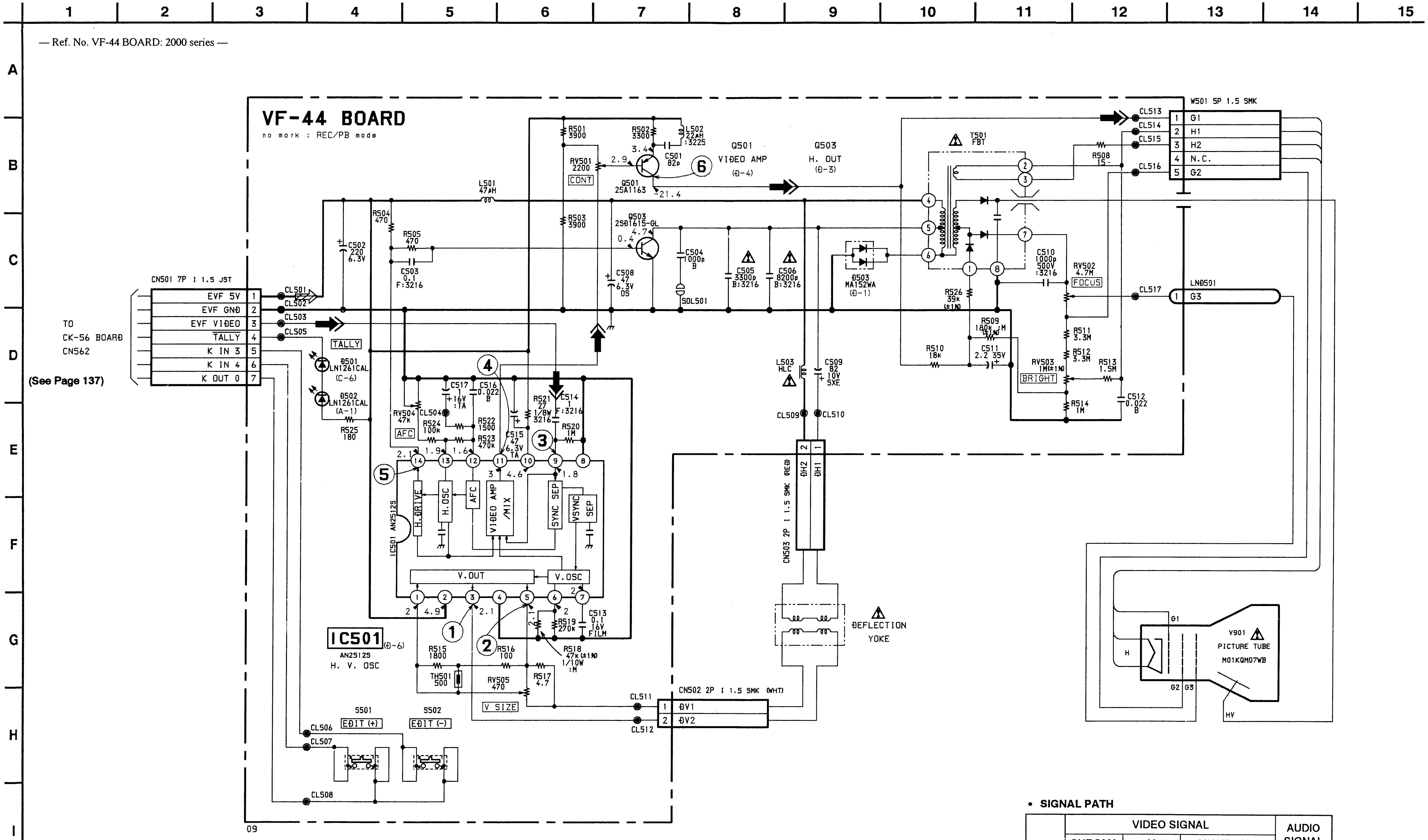
VF-44 (CONDUCTOR SIDE)



C
D
R511
C510
R514
R513
R508
R510
VF-44
1-642-183-
C512
D503
A
A
K
R525
R526
C506
C505
C504
B
C
E
Q503
C501
❻
Q501
B
E
R502
R501
R503
C517
R520
C514
C516
❸
8
7
IC501
❹
14
1
❺
R522
R523
❷
❶
R519
D501
K
A
R518
R517
R516
TH501
R521
R515
1-642-183-
12
1
2
3
4
5
6

VF-44 (VIEW FINDER) SCHEMATIC DIAGRAM

— Ref. No. VF-44 BOARD: 2000 series —

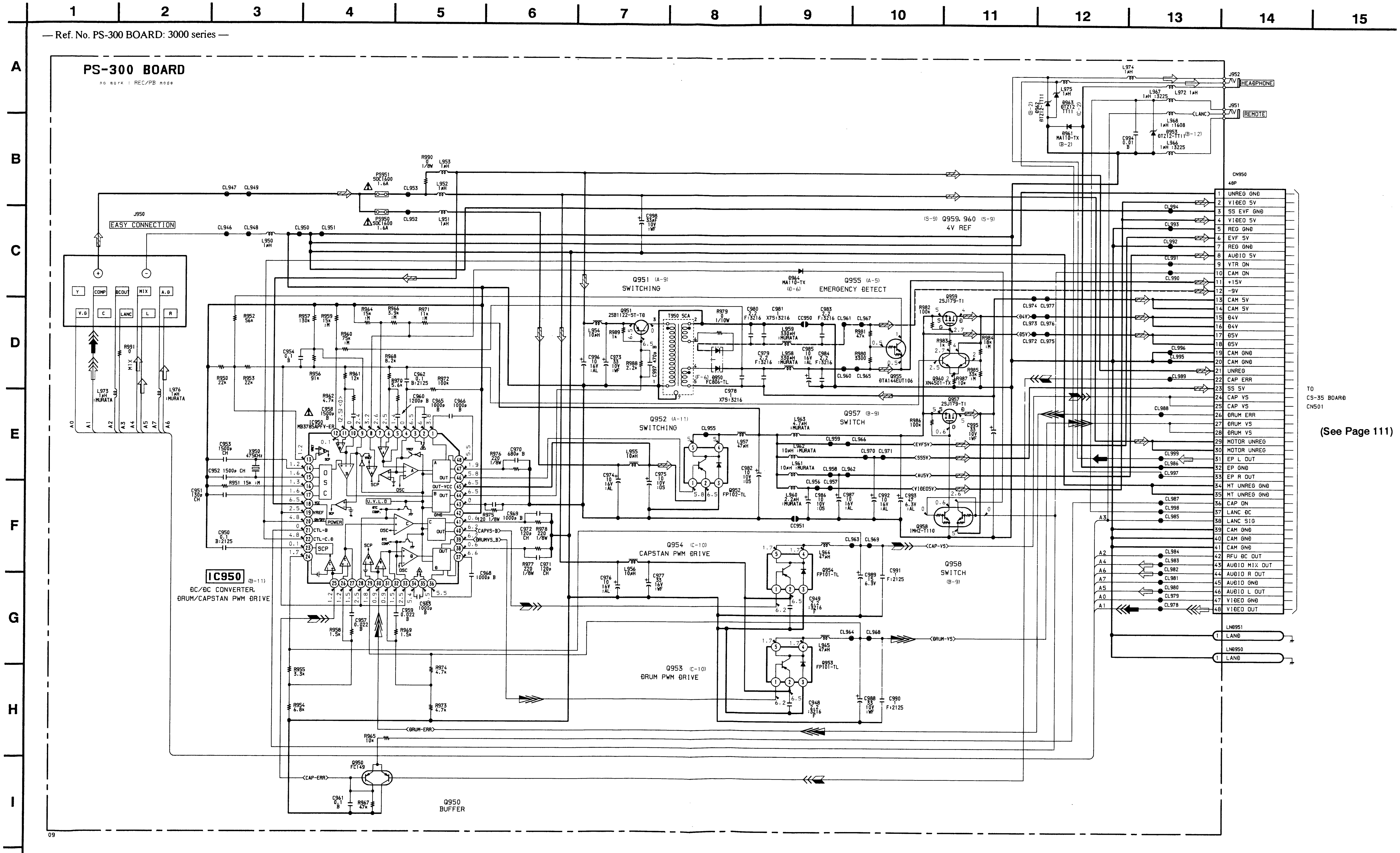

1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
A
B
C
D
E
F
G
H
I
J
VF-44 BOARD
no mark : REC/PB mode
TO
CK-56 BOARD
CN562
(See Page 137)
CN501 7P I 1.5 JST
EVF 5V
EVF GND
EVF VIDEO
TALLY
K IN 3
K IN 4
K OUT 0
CL501
CL502
CL503
CL505
TALLY
D501
LN1261CAL
(C-6)
D502
LN1261CAL
(A-1)
R525
180
C502
220
6.3V
R504
470
R505
470
C503
0.1
F:3216
L501
47μH
R501
3900
R503
3900
RV501
2200
CONT
R502
3300
L502
22μH
:3225
C501
82p
Q501
2SA1163
Q501
VIDEO AMP
(D-4)
Q503
H. OUT
(D-3)
Q503
2SD1615-GL
C508
47
6.3V
OS
C504
1000p
B
SOL501
C505
3300p
B:3216
C506
8200p
B:3216
D503
MA152WA
(D-1)
T501
FBT
R508
15
C510
1000p
500V
:3216
RV502
4.7M
FOCUS
R526
39k
R509
180k
R510
18k
C511
2.2 35V
R511
3.3M
R512
3.3M
RV503
1M
BRIGHT
R513
1.5M
R514
1M
C512
0.022
B
CL513
CL514
CL515
CL516
CL517
W501 5P 1.5 SMK
G1
H1
H2
N.C.
G2
LND501
G3
L503
HLC
C509
82
10V
SXE
CL509
CL510
CN503 2P I 1.5 SMK (RED)
DH2
DH1
DEFLECTION
YOKE
V901
PICTURE TUBE
M01KQM07WB
H
G1
G2
G3
HV
C517
1
16V
:TA
C516
0.022
B
RV504
47k
AFC
CL504
R524
100k
R522
1500
R523
470k
C515
47
6.3V
TA
R521
27
1/8W
3216
C514
1
F:3216
R520
1M
IC501 AN2512S
H.DRIVE
H.OSC
AFC
VIDEO AMP
/MIX
SYNC SEP
VSYNC
SEP
V.OUT
V.OSC
IC501
(D-6)
AN2512S
H. V. OSC
R515
1800
TH501
500
R516
100
RV505
470
V SIZE
R517
4.7
R518
47k
1/10W
:M
R519
270k
C513
0.1
16V
FILM
CL511
CL512
CN502 2P I 1.5 SMK (WHT)
DV1
DV2
S501
EDIT (+)
S502
EDIT (-)
CL506
CL507
CL508
09

• **SIGNAL PATH**

	VIDEO SIGNAL			AUDIO SIGNAL
	CHROMA	Y	Y/CHROMA	
REC		➡		
PB				

PS-300 (POWER REG/MECH DRIVE) SCHEMATIC DIAGRAM

— Ref. No. PS-300 BOARD: 3000 series —


PS-300 BOARD
no mark : REC/PB mode
J950
EASY CONNECTION
Y
COMP
BCOUT
MIX
A.G
V.G
C
LANC
L
R
IC950 (B-11)
DC/DC CONVERTER,
DRUM/CAPSTAN PWM DRIVE
MB3785APFV-ER
Q951 (A-9)
SWITCHING
2SB1122-ST-TD
T950 SCA
Q964 MA110-TX (D-6)
Q955 (A-5)
EMERGENCY DETECT
DTA144EUT106
Q959, 960 (S-9)
4V REF
2SJ179-T1
XN4501-TX
Q952 (A-11)
SWITCHING
FP102-TL
Q957 (B-9)
SWITCH
Q954 (C-10)
CAPSTAN PWM DRIVE
FP101-TL
Q953 (C-10)
DRUM PWM DRIVE
FP101-TL
Q958
SWITCH
(B-9)
IMH2-T110
Q950
BUFFER
FC149
PS951 SOC1600 1.6A
PS950 SOC1600 1.6A
J952
HEADPHONE
J951
REMOTE
LANC
CN950
48P
1 UNREG GND
2 VIDEO 5V
3 SS EVF GND
4 VIDEO 5V
5 REG GND
6 EVF 5V
7 REG GND
8 AUDIO 5V
9 VTR ON
10 CAM ON
11 +15V
12 -9V
13 CAM 5V
14 CAM 5V
15 D4V
16 D4V
17 D5V
18 D5V
19 CAM GND
20 CAM GND
21 UNREG
22 CAP ERR
23 SS 5V
24 CAP VS
25 CAP VS
26 DRUM ERR
27 DRUM VS
28 DRUM VS
29 MOTOR UNREG
30 MOTOR UNREG
31 EP L OUT
32 EP GND
33 EP R OUT
34 MT UNREG GND
35 MT UNREG GND
36 CAP ON
37 LANC DC
38 LANC SIG
39 CAM GND
40 CAM GND
41 CAM GND
42 RFU DC OUT
43 AUDIO MIX OUT
44 AUDIO R OUT
45 AUDIO GND
46 AUDIO L OUT
47 VIDEO GND
48 VIDEO OUT
LN6951
1 LAND
LN6950
1 LAND
TO
CS-35 BOARD
CN501
(See Page 111)
<CAP-VS>
<DRUM-VS>
<DRUM-ERR>
<CAP-ERR>
<EVFSV>
<SSSV>
<AUSV>
<VIDEOSV>
<D4V>
<D5V>
09

- **SIGNAL PATH**

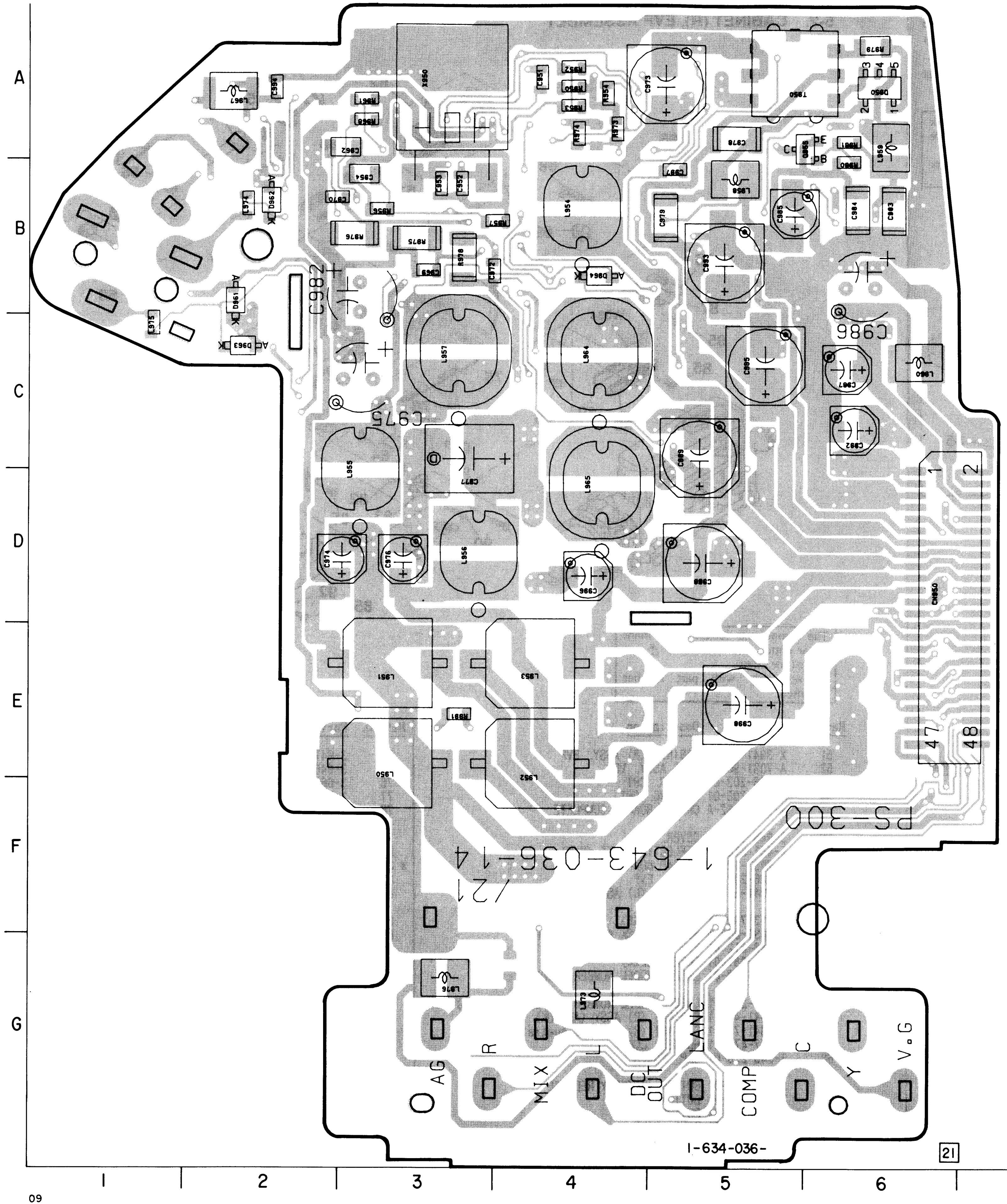
	VIDEO SIGNAL			AUDIO SIGNAL
	CHROMA	Y	Y/CHROMA	
REC			➡≫	➡
PB			⇨≫	⇨

	REC	REC/PB	PB
Drum speed servo		▷	
Drum phase servo		▷	
Drum servo (speed and phase)		▷	
Capstan phase servo	➤	➤≫	▷≫
Capstan servo (speed and phase)		➤≫	

PS-300 (POWER REG/MECH DRIVE) PRINTED WIRING BOARD

— Ref. No. PS-300 BOARD: 3000 series —

PS-300 BOARD (COMPONENT SIDE)


A
B
C
D
E
F
G
1
2
3
4
5
6
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T950
C973
C982
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C986
C987
C992
C993
C995
C988
C989
C996
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C974
C976
C977
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L957
L964
L965
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L951
L952
L953
L976
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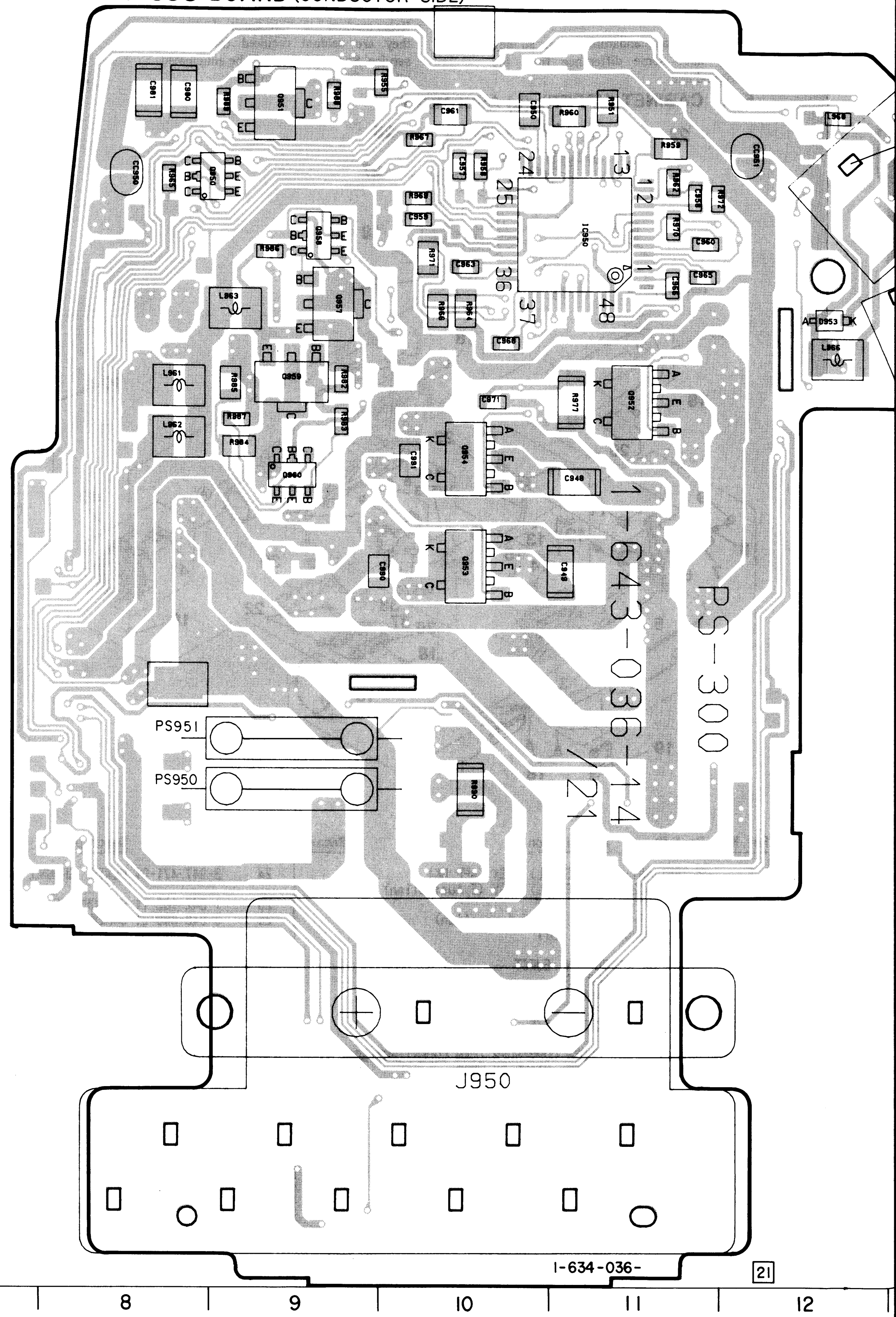
D962
D963
D964
CN950
1
2
47
48
PS-300
1-643-036-14
/21
AG
R
MIX
L
DC OUT
LANC
COMP
C
Y
V.G
1-634-036-
21

PS-300 BOARD (CONDUCTOR SIDE)


7
8
9
10
11
12
IC950
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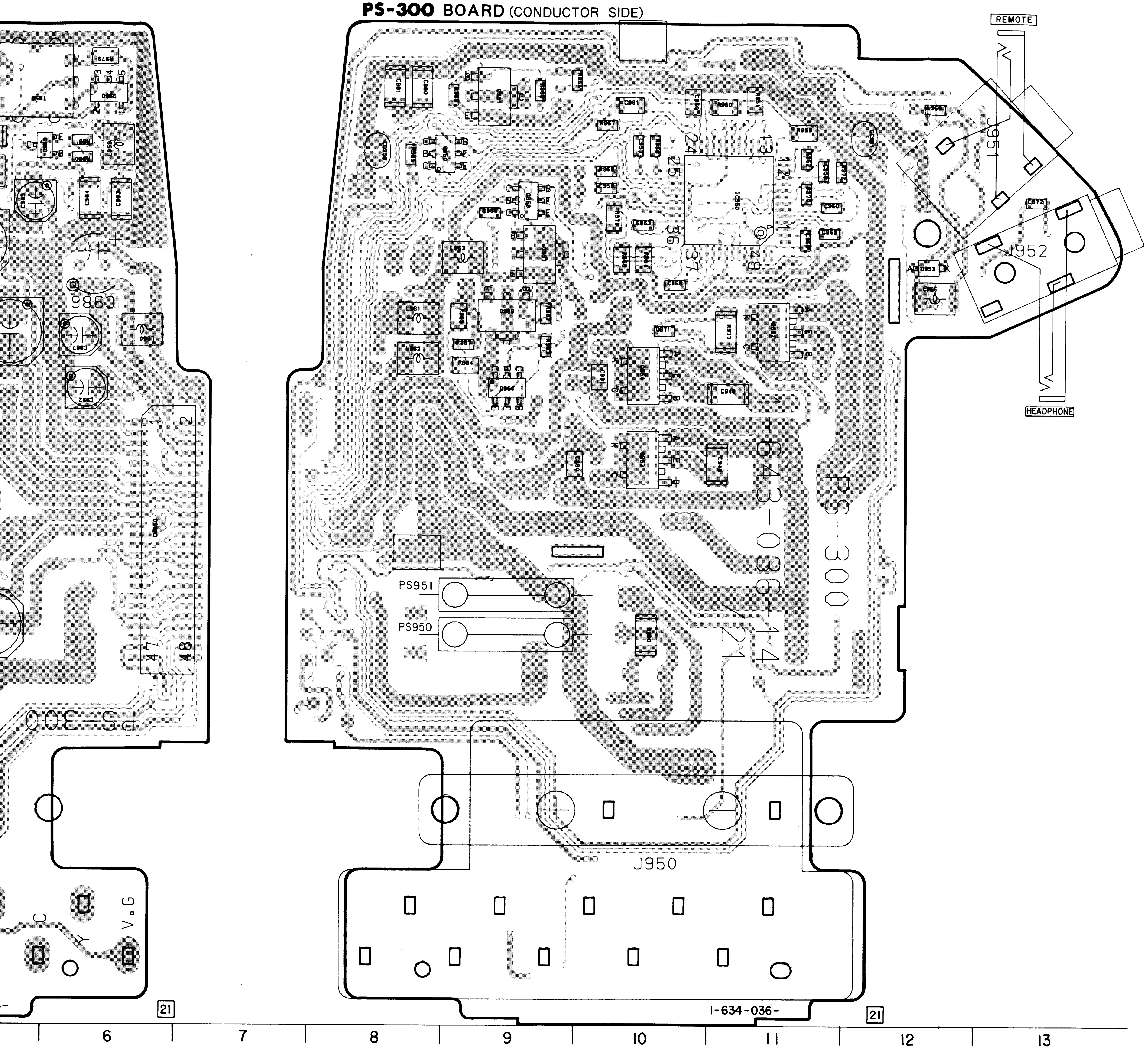
12
13
24
25
36
37
48
Q950
Q951
Q952
Q953
Q954
Q955
Q956
Q957
Q959
Q960
L961
L962
L963
L966
D953
PS951
PS950
PS-300
1-643-036-14
/21
J950
1-634-036-
21

PS-300 BOARD (CONDUCTOR SIDE)


REMOTE
HEADPHONE
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J952
J950
PS951
PS950
IC950
D953
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/121
PS-300
CN950
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6
7
8
9
10
11
12
13

		(DIODE)	
D950	8-719-989-33	DIODE	FC806
D953	8-719-110-03	DIODE	RD7. 5ES-B2
D961	8-719-404-46	DIODE	MA110
D962	8-719-110-03	DIODE	RD7. 5ES-B2
D963	8-719-110-03	DIODE	RD7. 5ES-B2
D964	8-719-404-46	DIODE	MA110
		(IC)	
⚠IC950	8-759-060-94	IC	MB3785APFV-G-BND-ER
		(TRANSISTOR)	
Q950	8-729-823-95	TRANSISTOR	FC149
Q951	8-729-804-41	TRANSISTOR	2SB1122-S
Q952	8-729-823-84	TRANSISTOR	FP102
Q953	8-729-823-82	TRANSISTOR	FP101
Q954	8-729-823-82	TRANSISTOR	FP101
Q955	8-729-905-12	TRANSISTOR	DTA144EU
Q957	8-729-011-26	TRANSISTOR	2SJ179
Q958	8-729-420-12	TRANSISTOR	XN4213
Q959	8-729-011-26	TRANSISTOR	2SJ179
Q960	8-729-402-81	TRANSISTOR	XN4501

4-3. SEMICONDUCTORS

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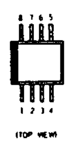
LM358D



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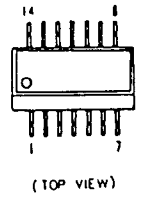

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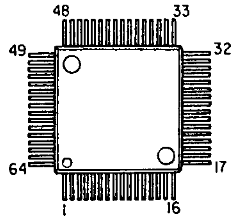

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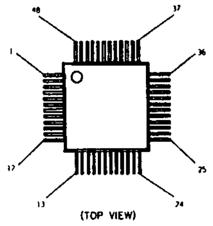

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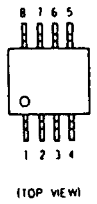

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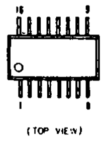

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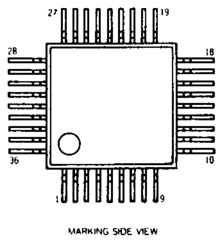
MARKING SIDE VIEW

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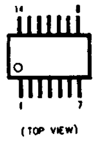

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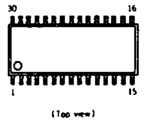

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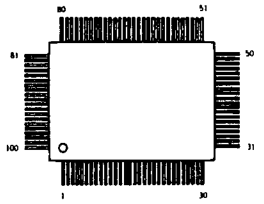

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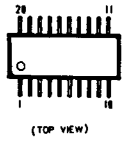

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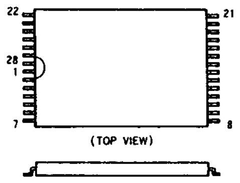

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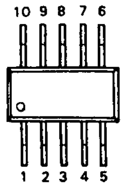

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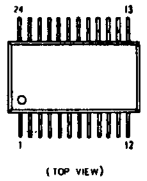

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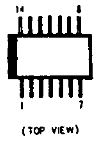

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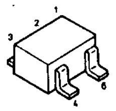

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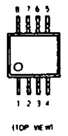

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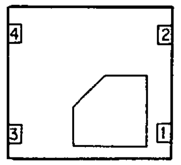

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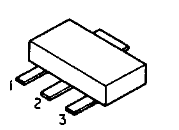

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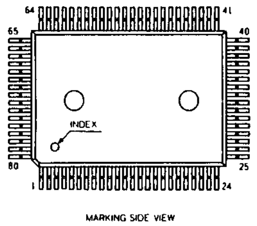
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MARKING SIDE VIEW

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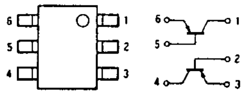

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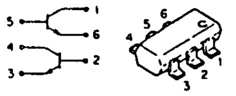
XN4501



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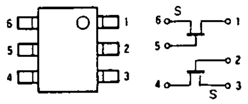

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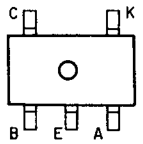

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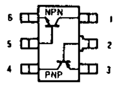

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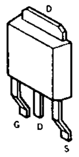

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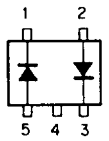

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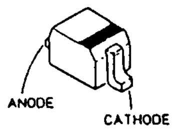
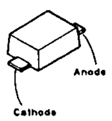
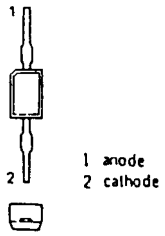

ANODE
CATHODE

MA728


Anode
Cathode

LN1261CAL


1 anode
2 cathode

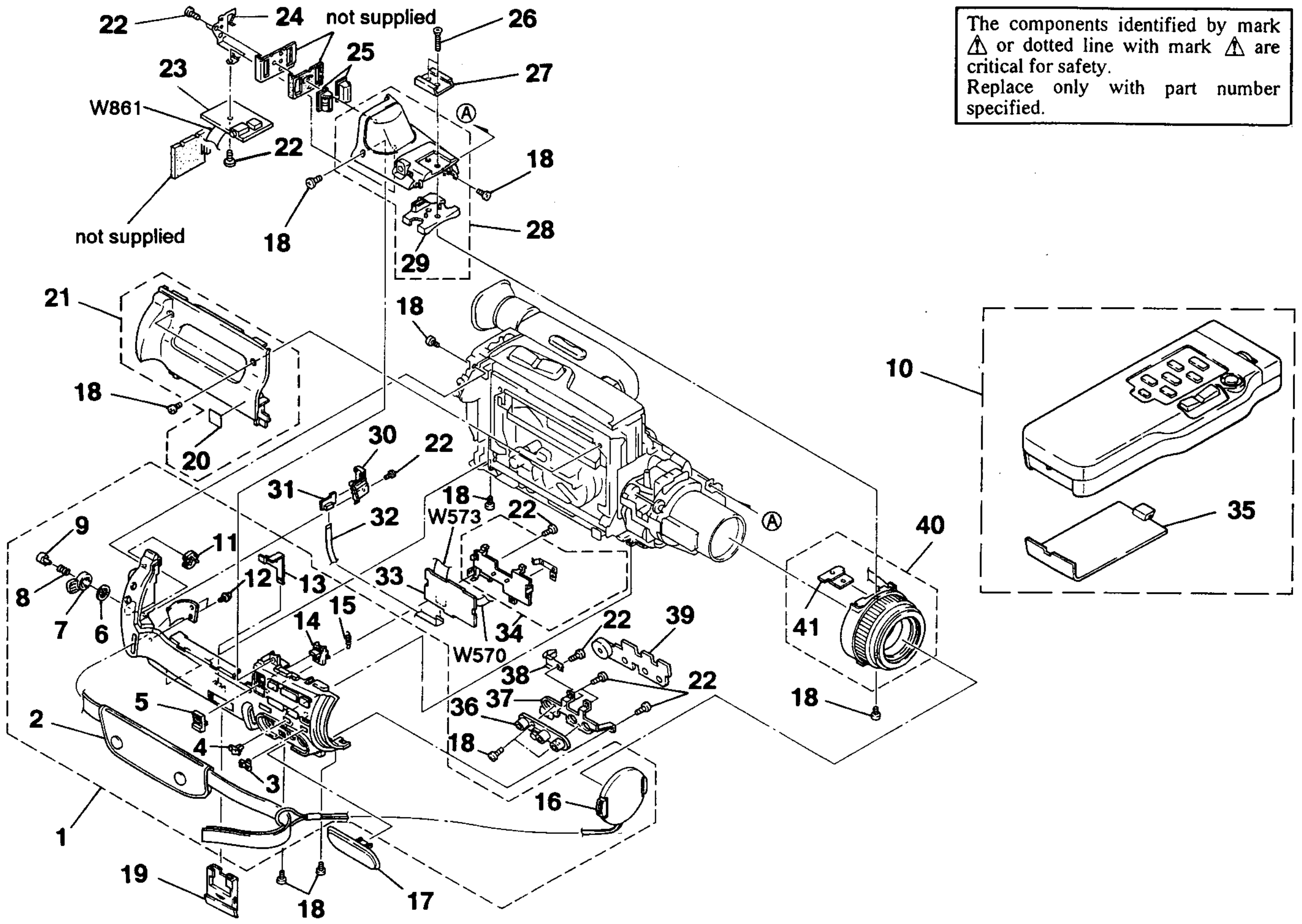
SECTION 5
EXPLODED VIEWS

NOTE:

- -XX, -X mean standardized parts, so they may have some difference from the original one.
- Items marked " ∗ " are not stocked since they are seldom required for routine service. Some delay should be anticipated when ordering these items.
- The mechanical parts with no reference number in the exploded views are not supplied.
- Hardware (# mark) list is given in the last of this parts list.

The components identified by mark ⚠ or dotted line with mark ⚠ are critical for safety.
Replace only with part number specified.

5-1. CABINET (UPPER), (L) ASSEMBLY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W573
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41
W570
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Ⓐ

Ref. No.	Part No.	Description	Remark
1	X-3941-481-1	CABINET (L) ASSY (AEP, UK)	
1	X-3942-003-1	CABINET (L) ASSY (E, Australian)	
2	3-736-807-01	BELT, GRIP	
3	3-947-479-01	KNOB, I/O (E, Australian)	
4	3-947-480-01	KNOB, EDIT	
5	3-946-195-01	BUTTON, EJECT	
6	3-736-364-01	SPRING	
7	3-942-985-01	KNOB, STAND-BY	
8	3-578-221-00	SPRING, COMPRESSION	
9	3-736-343-01	BUTTON, S/S	
* 10	1-693-017-11	REMOTE COMMANDER (CAM CODER)(RMT-509)	
11	3-946-260-01	HOLDER, STAND-BY KNOB	
12	3-669-480-21	+ PTPWH 2	
13	1-550-743-11	HOLDER, BATTERY	
14	3-946-194-01	LOCK, EJECT	
15	3-570-896-00	SPRING, TENSION	
16	A-7091-810-A	CAP BLOCK ASSY, LENS	
17	3-947-486-01	LID (M), JACK	
18	3-719-381-01	SCREW (M2X4)	
19	X-3941-541-1	HOLDER ASSY, LITHIUM	
* 20	3-703-713-41	STICKER, SONY SYMBOL (10)	
21	X-3941-484-1	LID ASSY, CASSETTE	
22	3-948-339-01	SCREW (BTP) (2X5), HEAD	
23	A-7063-128-A	MA-128P BOARD, COMPLETE	
24	3-947-471-01	PLATE, GROUND, MA	
25	1-542-162-11	MICROPHONE UNIT	
26	3-948-809-31	SCREW (M2X12)	
27	3-724-511-01	SHOE, ACCESSORY	
28	X-3941-479-1	CABINET (UPPER) ASSY	
29	3-946-234-01	PRISM, REMOTE CONTROL	
30	3-946-185-01	HOLDER, SW	
31	A-7071-581-A	SW-201P BOARD, COMPLETE	
32	1-690-604-11	CABLE, FLAT (FFC-33) 4P	
33	A-7071-579-A	VK-24P BOARD, COMPLETE (AEP, UK)	
33	A-7071-702-A	VK-24P BOARD, COMPLETE (E, Australian)	
34	X-3941-544-1	HOLDER ASSY, VK	
35	3-947-500-01	LID, BATTERY CASE	
36	1-537-415-11	TERMINAL BOARD	
37	3-947-485-01	BRACKET, PJ	
38	3-947-487-01	PLATE, GROUND, PJ	
39	A-7071-580-A	PJ-47P BOARD, COMPLETE (AEP, UK)	
39	A-7071-703-A	PJ-47P BOARD, COMPLETE (E, Australian)	
40	1-241-855-11	RES VAR, CARBON (uF) 50K	
W570	1-643-075-11	FP-6 FLEXIBLE BOARD	
W573	1-690-774-11	CABLE, FLAT(FFC-56) 11P	
W861	1-690-773-11	CABLE, FLAT (FFC-53) 9P	

5-2. CA

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critical for sa
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specified.

Ref. No.	Part
51	X-39
52	A-70
53	3-94
54	3-94
55	A-70
56	3-94
⚠57	1-45
58	A-70
59	3-94
60	X-39
61	3-71
62	A-70
63	3-94
64	3-71
* 65	3-94
* 65	3-94
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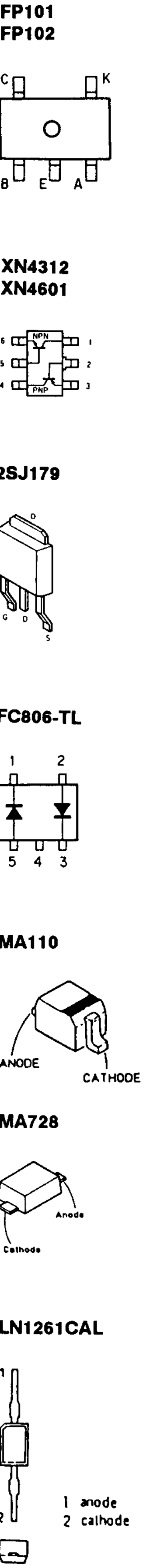
73	3-94


FP101
FP102
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K
B
E
A
XN4312
XN4601
NPN
PNP
2SJ179
FC806-TL
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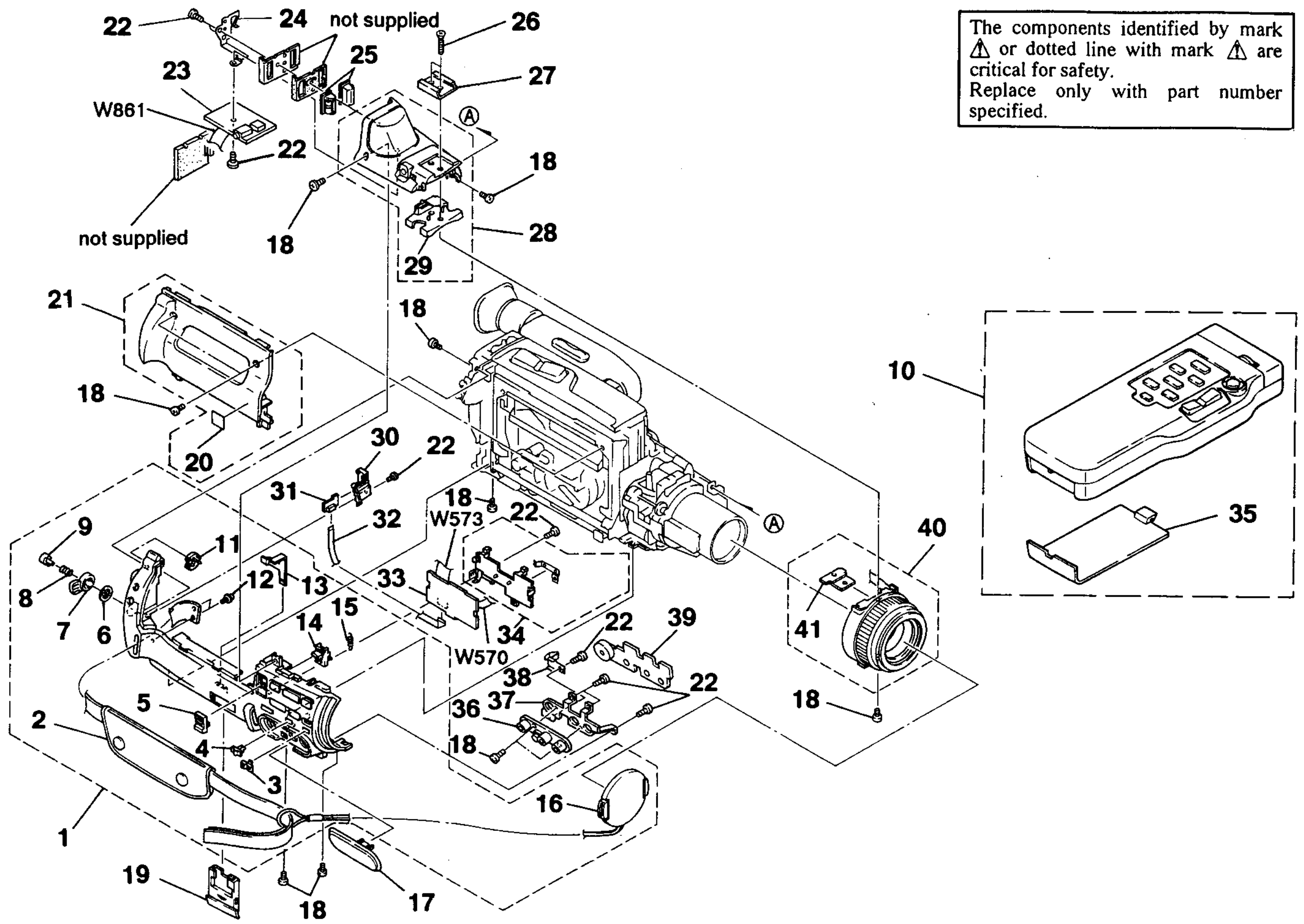
5 4 3
MA110
ANODE
CATHODE
MA728
Anode
Cathode
LN1261CAL
1 anode
2 cathode

SECTION 5
EXPLODED VIEWS

NOTE:
- -XX, -X mean standardized parts, so they may have some difference from the original one.
- Items marked " * " are not stocked since they are seldom required for routine service. Some delay should be anticipated when ordering these items.
- The mechanical parts with no reference number in the exploded views are not supplied.
- Hardware (# mark) list is given in the last of this parts list.

5-1. CABINET (UPPER), (L) ASSEMBLY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W570
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38
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36
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16
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19
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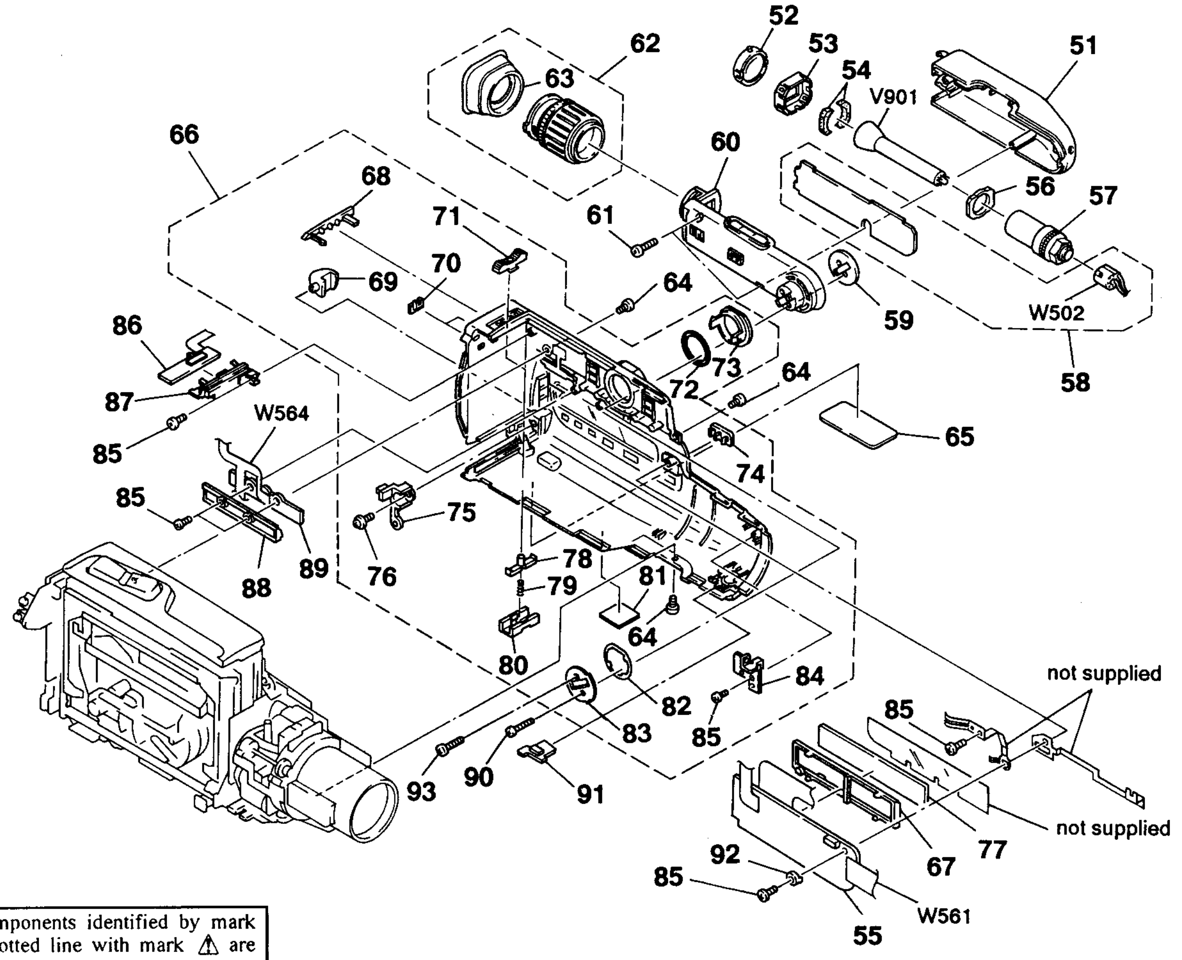
17
Ⓐ

The components identified by mark ⚠ or dotted line with mark ⚠ are critical for safety.
Replace only with part number specified.

Ref. No.	Part No.	Description	Remark
1	X-3941-481-1	CABINET (L) ASSY (AEP, UK)	
1	X-3942-003-1	CABINET (L) ASSY (E, Australian)	
2	3-736-807-01	BELT, GRIP	
3	3-947-479-01	KNOB, I/O (E, Australian)	
4	3-947-480-01	KNOB, EDIT	
5	3-946-195-01	BUTTON, EJECT	
6	3-736-364-01	SPRING	
7	3-942-985-01	KNOB, STAND-BY	
8	3-578-221-00	SPRING, COMPRESSION	
9	3-736-343-01	BUTTON, S/S	
* 10	1-693-017-11	REMOTE COMMANDER (CAM CODER)(RMT-509)	
11	3-946-260-01	HOLDER, STAND-BY KNOB	
12	3-669-480-21	+ PTPWH 2	
13	1-550-743-11	HOLDER, BATTERY	
14	3-946-194-01	LOCK, EJECT	
15	3-570-896-00	SPRING, TENSION	
16	A-7091-810-A	CAP BLOCK ASSY, LENS	
17	3-947-486-01	LID (M), JACK	
18	3-719-381-01	SCREW (M2X4)	
19	X-3941-541-1	HOLDER ASSY, LITHIUM	
* 20	3-703-713-41	STICKER, SONY SYMBOL (10)	
21	X-3941-484-1	LID ASSY, CASSETTE	
22	3-948-339-01	SCREW (BTP) (2X5), HEAD	
23	A-7063-128-A	MA-128P BOARD, COMPLETE	
24	3-947-471-01	PLATE, GROUND, MA	
25	1-542-162-11	MICROPHONE UNIT	
26	3-948-809-31	SCREW (M2X12)	
27	3-724-511-01	SHOE, ACCESSORY	
28	X-3941-479-1	CABINET (UPPER) ASSY	
29	3-946-234-01	PRISM, REMOTE CONTROL	
30	3-946-185-01	HOLDER, SW	
31	A-7071-581-A	SW-201P BOARD, COMPLETE	
32	1-690-604-11	CABLE, FLAT (FFC-33) 4P	
33	A-7071-579-A	VK-24P BOARD, COMPLETE (AEP, UK)	
33	A-7071-702-A	VK-24P BOARD, COMPLETE (E, Australian)	
34	X-3941-544-1	HOLDER ASSY, VK	
35	3-947-500-01	LID, BATTERY CASE	
36	1-537-415-11	TERMINAL BOARD	
37	3-947-485-01	BRACKET, PJ	
38	3-947-487-01	PLATE, GROUND, PJ	
39	A-7071-580-A	PJ-47P BOARD, COMPLETE (AEP, UK)	
39	A-7071-703-A	PJ-47P BOARD, COMPLETE (E, Australian)	
40	1-241-855-11	RES VAR, CARBON (uF) 50K	
W570	1-643-075-11	FP-6 FLEXIBLE BOARD	
W573	1-690-774-11	CABLE, FLAT(FFC-56) 11P	
W861	1-690-773-11	CABLE, FLAT (FFC-53) 9P	

5-2. CABINET (R), EVF ASSEMBLY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V901
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W502
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W564
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not supplied
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W561
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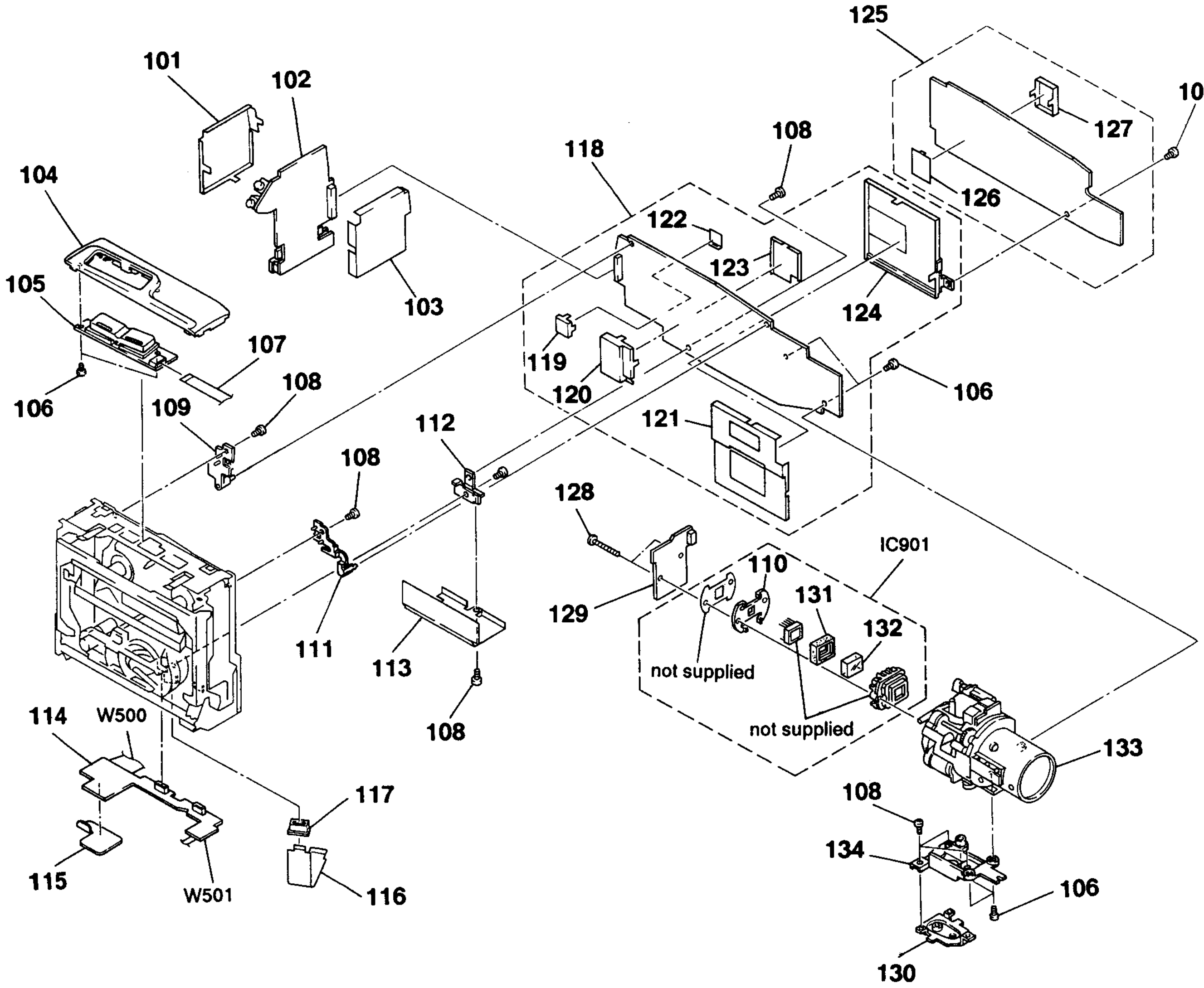
The components identified by mark ⚠ or dotted line with mark ⚠ are critical for safety.
Replace only with part number specified.

Ref. No.	Part No.	Description	Remark
51	X-3941-319-1	CABINET (R) ASSY, EVF	
52	A-7081-905-A	LENS ASSY, VF	
53	3-946-203-01	HOLDER, CRT	
54	3-946-205-01	PACKING, CRT	
55	A-7071-582-A	CK-56P BOARD, COMPLETE	
56	3-946-204-01	COVER, CRT	
⚠57	1-451-310-21	DEFLECTION YOKE (B/W)	
58	A-7063-129-A	VF-44P BOARD, COMPLETE	
59	3-946-202-01	JOINT, EVF	
60	X-3941-318-1	CABINET (L) ASSY, EVF	
61	3-713-790-31	SCREW (M2X8), TAPPING, P3	
62	A-7081-897-A	HOLDER BLOCK ASSY, FINDER	
63	3-946-212-01	EYE CUP	
64	3-719-381-01	SCREW (M2X4)	
* 65	3-947-489-01	LABEL, MODEL NUMBER (AEP)	
* 65	3-949-279-01	LABEL, MODEL NUMBER (UK, E, Australian)	
66	X-3941-480-1	CABINET (R) ASSY (AEP, UK)	
66	X-3941-769-1	CABINET (R) ASSY (E, Australian)	
67	3-947-478-01	HOLDER, LCD	
68	3-946-256-01	CAP, POWER	
69	3-946-246-01	BUTTON, BATTERY RELEASE	
70	3-946-251-01	BUTTON, ON/OFF	
71	3-946-248-01	BUTTON, POWER	
72	3-946-253-01	RING, TILT	
73	3-946-252-01	SLEEVE, EVF	
74	3-947-477-01	BUTTON, AUTO	
75	3-946-250-01	CLAW, BATTERY LOCK	
76	3-669-480-21	+ PTPWH 2	
77	1-809-663-11	DISPLAY PANEL, LIQUID CRYSTAL	
78	3-946-186-01	PUSH BUTTON, POWER	
79	3-303-973-00	SPRING, COMPRESSION	
80	3-946-249-01	PLATE, FUNCTION, POWER	
* 81	3-704-235-01	LABEL, CAUTION (UK)	
82	3-946-255-01	SPRING, LEAF, TILT	
83	3-946-254-01	PLATE, LOCK, TILT	
84	3-947-315-01	PLATE, FIXED, CABINET	
85	3-948-339-01	SCREW (BTP) (2X5), HEAD	
86	A-7071-584-A	PK-32P BOARD, COMPLETE	
87	3-946-198-01	RETAINER, PK	
88	3-947-474-01	RETAINER, DK	
89	1-643-031-11	DK-21P BOARD	
90	3-740-546-51	SCREW (M2X9)	
91	A-7071-585-A	FK-54P BOARD, COMPLETE	
92	3-947-482-01	SPACER, CK	
93	3-948-094-01	SCREW (+P2X9), EVF	
⚠V901	1-546-091-11	CATHODE-RAY TUBE, B/W	
⚠W502	1-526-948-51	SOCKET ASSY, CRT	
W561	1-690-775-11	CABLE FLAT (FFC-52) 20P	
W564	1-643-081-11	FP-492 FLEXIBLE BOARD	

5-3. MAIN BOARD ASSEMBLY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IC901
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not supplied
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not supplied
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W500
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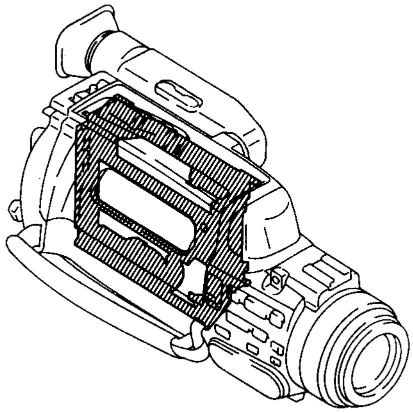
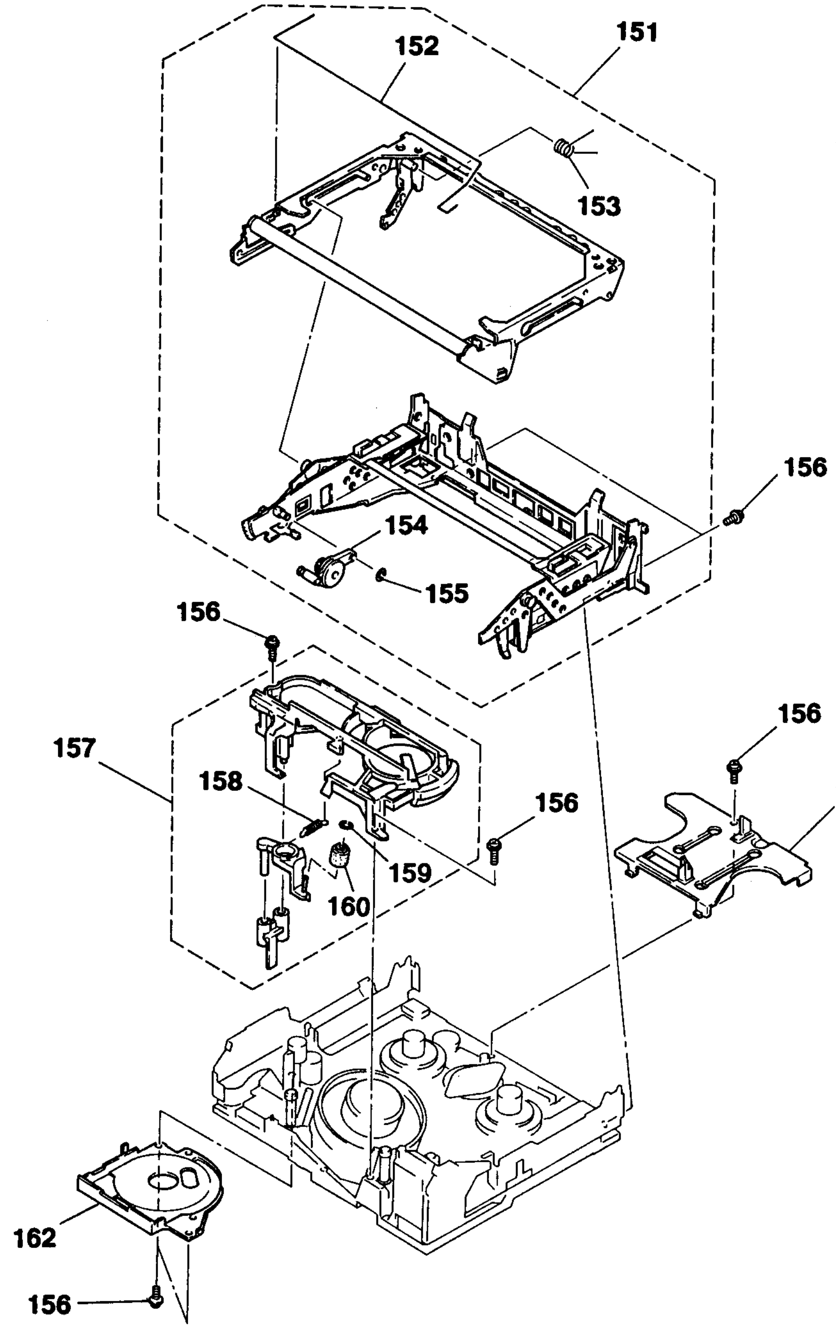
Ref. No.	Part No.	Description	Remark
* 101	3-946-183-01	CASE (MAIN), SHIELD, PS	
102	A-7063-125-A	PS-300P BOARD, COMPLETE	
* 103	X-3941-499-1	SHIELD (LID) ASSY, PS	
104	X-3941-320-1	LID ASSY, LS	
105	1-692-025-11	SWITCH, PUSH	
106	3-948-339-01	SCREW (BTP) (2X5), HEAD	
107	1-643-555-11	FP-558 FLEXIBLE BOARD	
108	3-719-381-01	SCREW (M2X4)	
109	A-7081-889-A	HOLDER (R) ASSY, CS	
110	3-946-856-11	ADAPTOR (H), CCD FITTING	
111	A-7081-888-A	HOLDER (F) ASSY, CS	
112	3-946-175-01	HOLDER (B), CS	
113	X-3941-522-1	PLATE ASSY, SHIELD, DRUM	
114	A-7063-127-A	SL-25P BOARD, COMPLETE	
* 115	3-947-660-01	INSULATOR, SL	
116	1-642-187-11	FP-426 FLEXIBLE BOARD	
117	1-691-471-11	CONNECTOR, TRANSLATION 11P	
118	A-7063-124-A	CS-35P BOARD, COMPLETE	
* 119	3-946-179-01	CASE (MAIN), SHIELD, FE	
* 120	3-948-499-01	CASE (MAIN), SHIELD, RP	
* 121	X-3941-498-1	SHIELD (LID) ASSY, CAMERA	
* 122	3-946-180-01	CASE (LID), SHIELD, FE	
* 123	3-946-178-01	CASE (LID), SHIELD, RP	
* 124	X-3941-314-1	SHIELD ASSY, CAMERA	
125	A-7063-126-A	VA-74P BOARD, COMPLETE (AEP, UK)	
125	A-7063-332-A	VA-74P BOARD, COMPLETE (E, Australian)	
* 126	3-946-182-01	CASE (LID), SHIELD, VA	
* 127	3-946-181-01	CASE (MAIN), SHIELD, VA	
128	3-947-268-01	SCREW (P TIGHT) (2), TAPPING	
129	A-7063-123-A	CD-76P BOARD, COMPLETE	
130	3-946-224-01	SHEET METAL, TRIPOD	
131	3-946-857-11	RUBBER (S), SEAL	
132	1-547-558-21	FILTER BLOCK, OPTICAL	
133	1-547-541-11	LENS, ZOOM (VCL-6110WB)(TYPE I)	
133	1-547-561-21	LENS, ZOOM (VCL-6110WC)(TYPE II)	
134	3-946-223-01	HOLDER (C), LENS	
IC901	A-7030-331-A	CCD BLOCK ASSY (AUTO)(CCD IMAGER)	
W500	1-644-461-21	FP-600 FLEXIBLE BOARD	
W501	1-642-186-11	FP-437 FLEXIBLE BOARD	

5-4. CASSETTE COMPARTMENT ASSEMBLY

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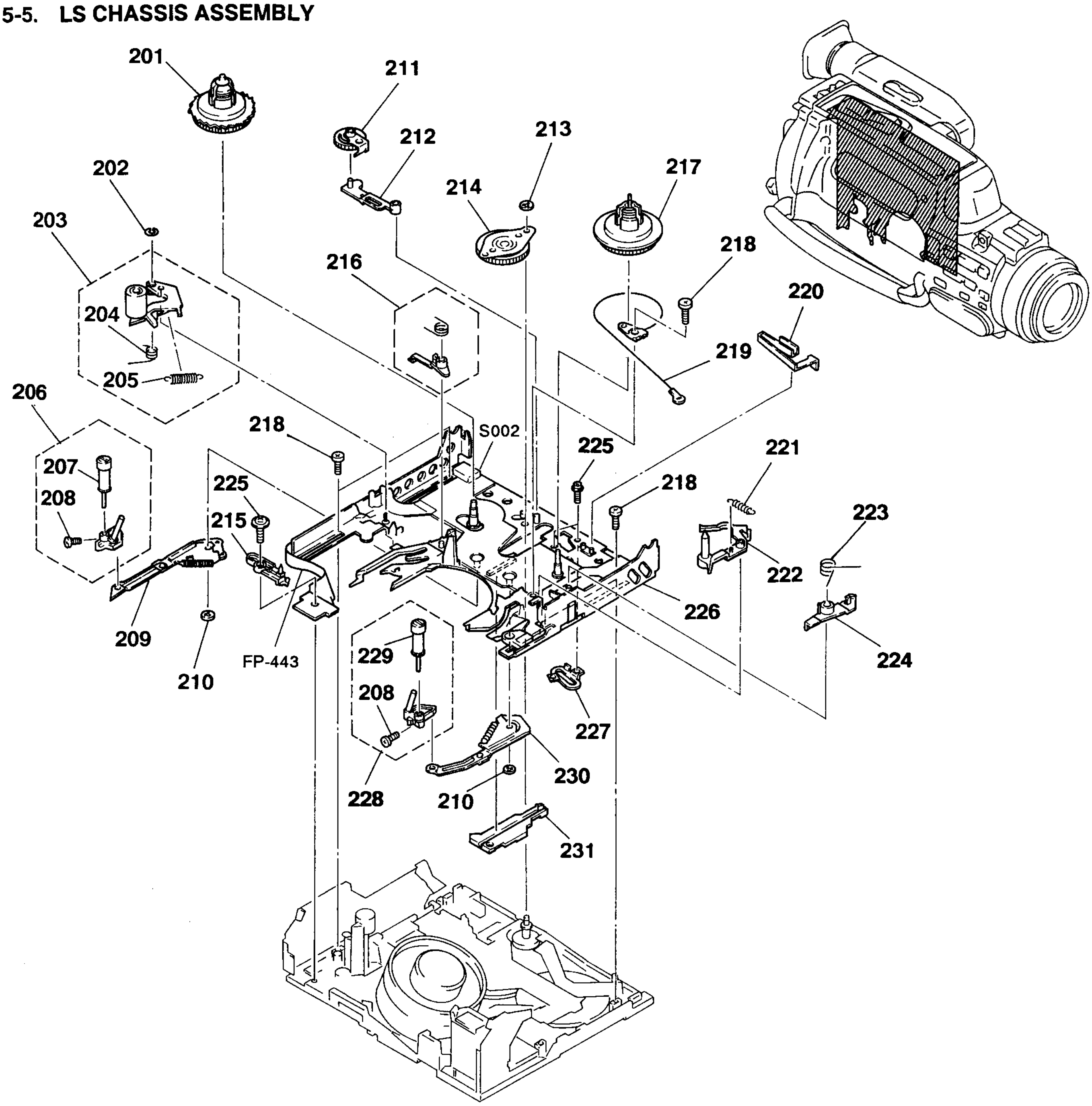
Ref. No.	Part No.	Description	Remark
151	A-7040-312-A	CASSETTE COMPARTMENT BLOCKASSY	
152	3-945-773-01	BAR, TORSION	
153	3-945-771-01	SPRING, TORSION	
154	X-3941-287-2	DAMPER ASSY	
155	3-315-384-31	WASHER, STOPPER	
156	3-947-503-01	SCREW (M1.4X2.5)	
157	A-7040-309-A	PROTECT (BASE) BLOCK ASSY	
158	3-945-760-01	SPRING, TENSION	
159	3-321-393-01	WASHER, STOPPER	
160	X-3726-817-3	ROLLER ASSY, HC	
161	X-3941-280-1	RETAINER ASSY, GOOSENECK	
162	3-945-733-01	COVER, CAPSTAN	

5-5. LS CHASSIS ASSEMBLY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S002
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FP-443
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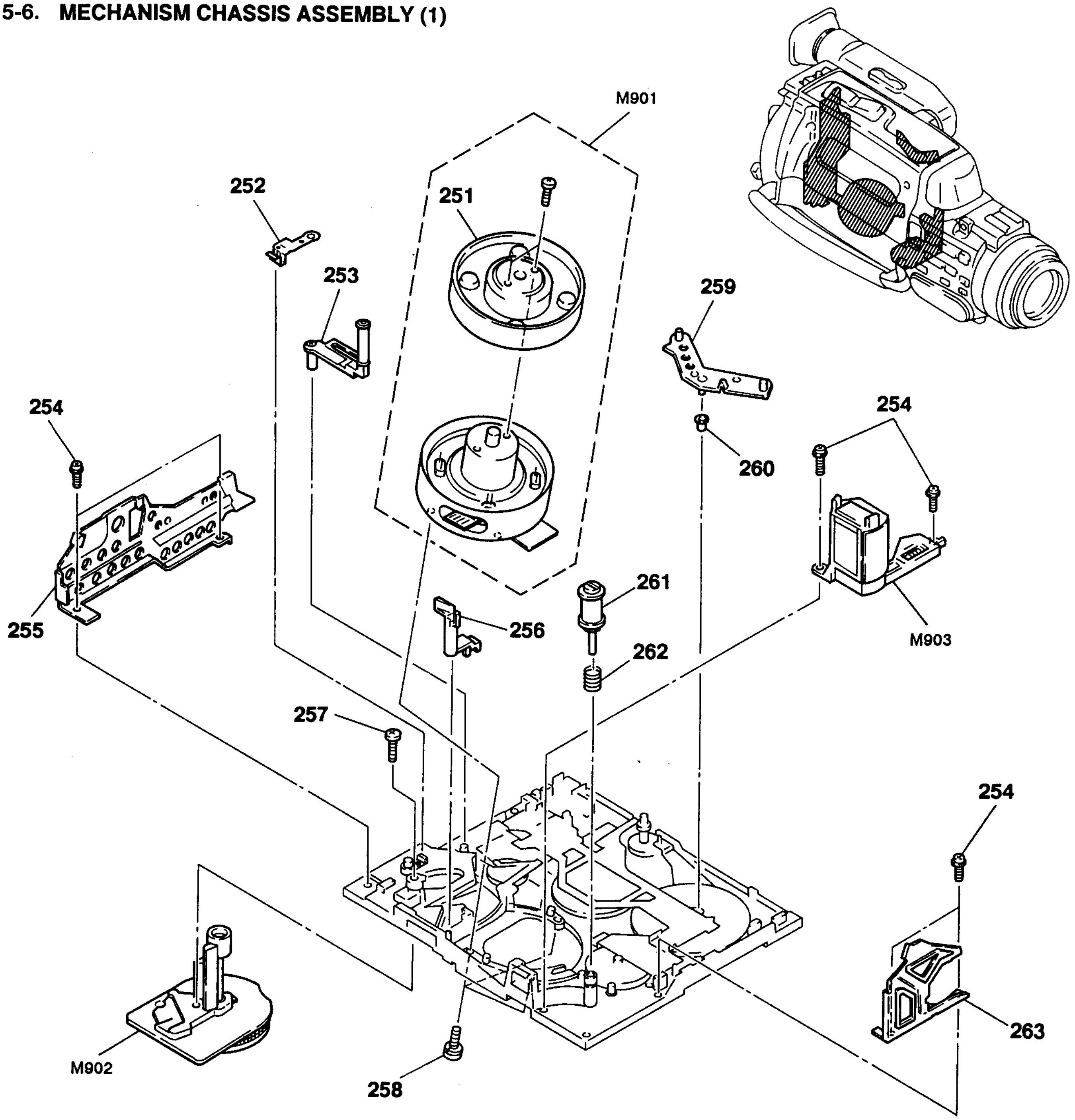
Ref. No.	Part No.	Description	Remark
201	X-3941-274-1	TABLE ASSY, REEL, T	
202	3-331-007-21	WASHER	
203	X-3941-271-1	ARM ASSY, PINCH	
204	3-945-743-01	SPRING, TORSION	
205	3-945-783-01	SPRING, TENSION	
206	A-7040-307-A	GUIDE (BASE) (T) BLOCK ASSY	
207	X-3941-424-1	ROLLER ASSY, TG6	
208	3-947-504-01	SCREW (M1.2X2)	
209	X-3941-267-1	ARM (T) ASSY, GUIDE	
210	3-669-465-00	WASHER (1.5), STOPPER	
211	X-3941-273-1	SOFT ASSY, T	
212	3-945-753-01	ARM, T SOFT	
213	3-726-829-01	WASHER, STOPPER	
214	X-3941-279-1	GEAR ASSY, GOOSENECK	
215	3-947-644-01	RETAINER, TG5 (BASE)	
216	A-7040-321-A	CLAW BLOCK ASSY, T HARD	
217	X-3941-275-1	TABLE ASSY, REEL, S	
218	3-945-756-01	SCREW (M1.4X3)	
219	X-3941-277-1	STRING BLOCK ASSY	
220	3-945-801-01	BRAKE, S SOFT	
221	3-948-810-01	SPRING, TENSION	
222	X-3941-276-1	TG1 ASSY	
223	3-945-752-01	SPRING, TORSION	
224	3-945-799-01	BRAKE, S HARD	
225	3-947-503-01	SCREW (M1.4X2.5)	
226	X-3941-265-1	CHASSIS ASSY, LS	
227	3-945-784-01	PLATE, CAM, LS	
228	A-7040-306-A	GUIDE (BASE) (S) BLOCK ASSY	
229	X-3942-129-1	ROLLER ASSY (SUS), TG3	
230	X-3941-266-1	ARM (S) ASSY, GUIDE	
231	3-945-837-01	SLIDER, GL	
S002	1-572-987-11	SWITCH, PUSH (3 KEY) (REC PROOF, ME/MP, MP/MP-HG)	

5-6. MECHANISM CHASSIS ASSEMBLY (1)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M903
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M902
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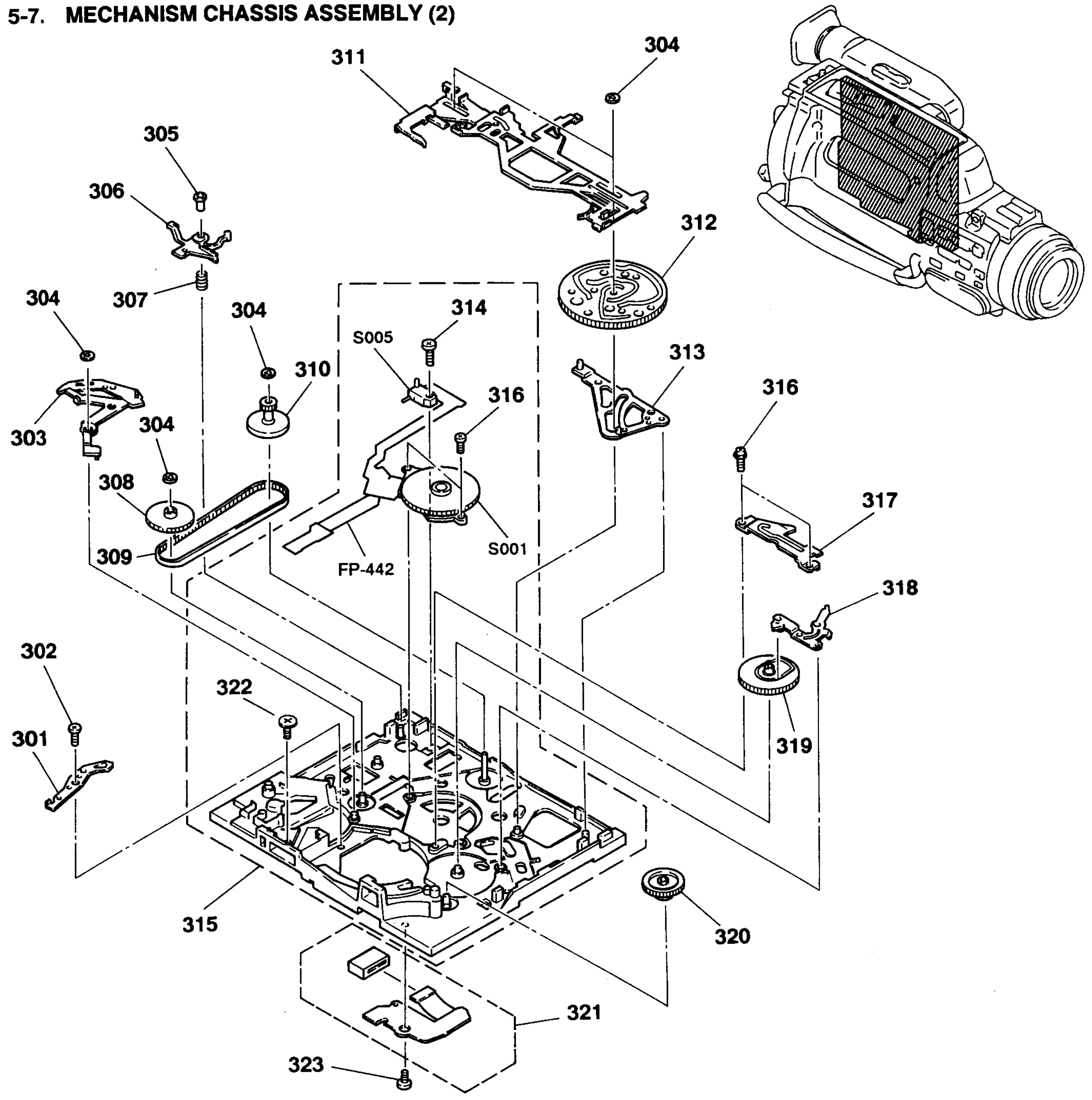
Ref. No.	Part No.	Description	Remark
251	A-7049-521-A	DRUM ASSY, UPPER (DGR-90-R)	
252	3-945-822-01	SPRING, LEAF, TG7 ARM	
253	A-7040-305-A	ARM BLOCK ASSY, TG7	
254	3-947-503-01	SCREW (M1.4X2.5)	
255	X-3941-255-1	PLATE (T) ASSY, SIDE	
256	3-945-735-01	ARM, HC CONVERSION	
257	3-713-786-71	SCREW (M2X5)	
258	3-686-493-01	SCREW (M2X5), P1	
259	3-945-701-01	ARM, LS	
260	3-945-702-01	ROLLER, LS	
261	X-3941-262-1	ROLLER ASSY, TG2	
262	3-945-774-01	SPRING, COMPRESSION	
263	3-945-691-01	PLATE (S), SIDE	
M901	A-7048-585-A	DRUM ASSY (DGH-90A-R)	
M902	8-835-477-01	MOTOR, DC SCE-0101A (CAPSTAN)	
M903	A-7040-304-A	MOTOR BLOCK ASSY, LM (LOADING)	

5-7. MECHANISM CHASSIS ASSEMBLY (2)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S005
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S001
FP-442
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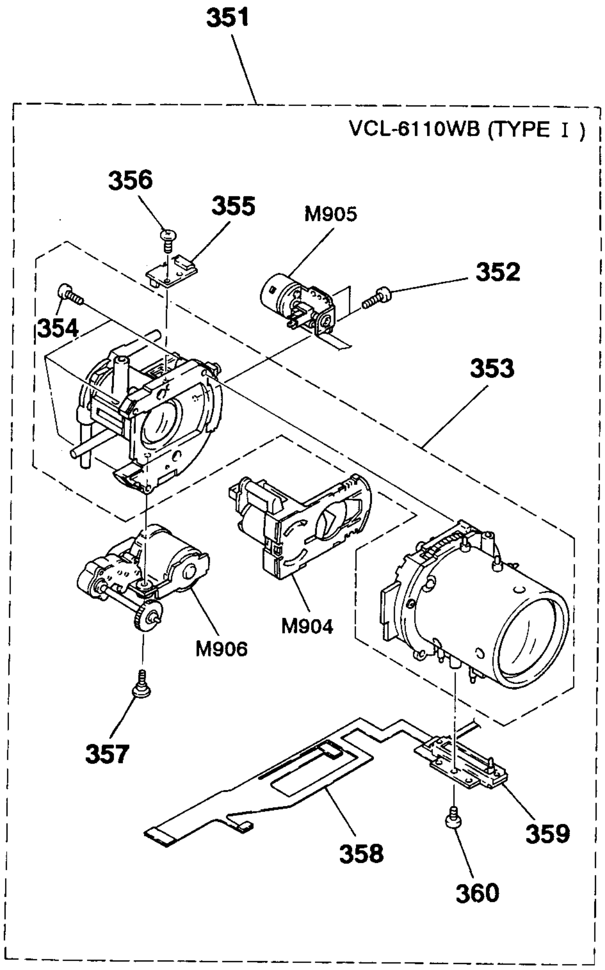
Ref. No.	Part No.	Description	Remark
301	3-945-734-01	ARM, HC DRIVING	
302	3-728-103-11	SCREW (M1.4X1.6), SPECIAL HEAD	
303	X-3941-259-1	ARM ASSY, PINCH PRESS	
304	3-726-829-01	WASHER, STOPPER	
305	3-945-730-01	SLEEVE, EJECT	
306	3-945-706-01	LEVER, EJECT	
307	3-945-729-01	SPRING, COMPRESSION	
308	X-3941-256-1	GEAR ASSY, CHANGE	
309	3-944-539-01	BELT, RELAY	
310	3-945-695-01	PULLEY, RELAY	
311	X-3941-260-1	SLIDER ASSY, M	
312	3-945-696-01	CAM	
313	X-3941-258-1	ARM ASSY, GL	
314	3-713-786-71	SCREW (M2X5)	
315	A-7040-303-A	CHASSIS ASSY, MECHANICAL	
316	3-947-503-01	SCREW (M1.4X2.5)	
317	3-945-722-01	RETAINER, GEAR	
318	X-3941-257-1	ARM ASSY, FF	
319	3-945-697-01	GEAR (B), L	
320	3-945-700-01	GEAR (A), L	
321	A-7040-311-A	FP-444 ASSY	
322	3-946-848-01	SCREW, TG6 ADJUSTMENT	
323	3-945-756-01	SCREW (M1.4X3)	
S001	1-572-986-11	SWITCH, ROTARY (ENCODER)	
S005	1-570-771-21	SWITCH (C DOWN)	

5-8. ZOOM LENS ASSEMBLY (VCL-6110WB), (VCL-6110WC)

(Distinguishing TYPE Ⅰ (VCL-6110WB) from TYPE Ⅱ (VCL-6110WC)
The sensor board attached to the flexible board (Ref. No. 358 or No. 362) or TYPE Ⅰ (VCL-6110WB) can be removed with a connector (Ref. No. 355) while that of TYPE Ⅱ (VCL-6110WC) cannot.)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VCL-6110WB (TYPE Ⅰ)
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M905
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M904
M906
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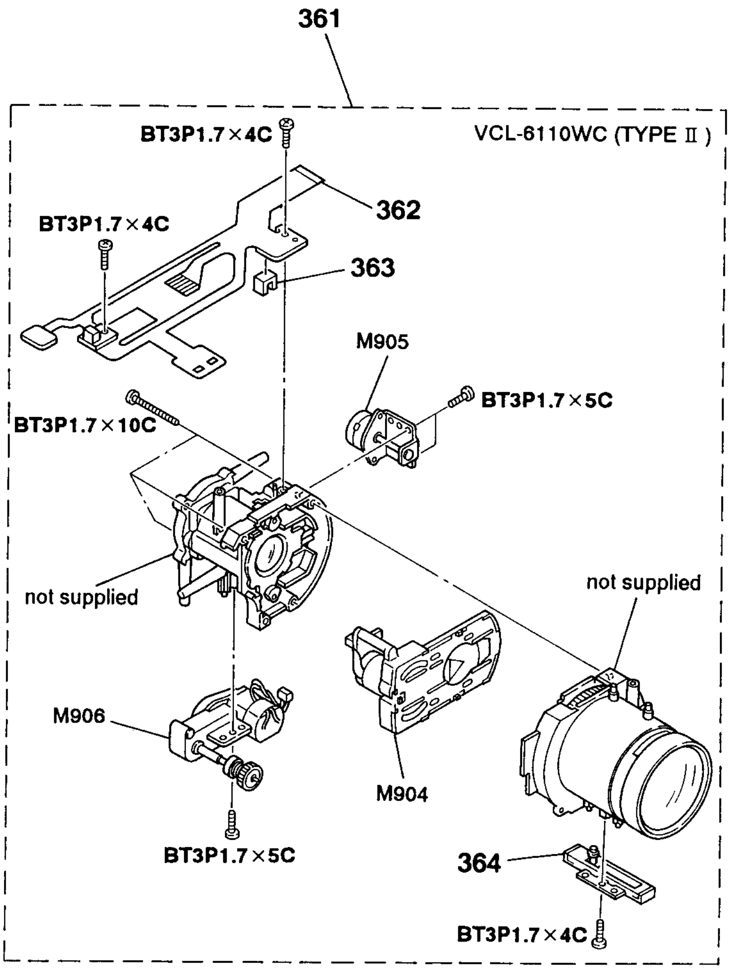
361
BT3P1.7×4C
VCL-6110WC (TYPE Ⅱ)
362
BT3P1.7×4C
363
M905
BT3P1.7×5C
BT3P1.7×10C
not supplied
not supplied
M906
M904
BT3P1.7×5C
364
BT3P1.7×4C

Ref. No.	Part No.	Description	Remark
351	1-547-541-11	LENS, ZOOM (VCL-6110WB)(TYPE I)	
352	3-708-390-01	SCREW, FITTING, FOCUS MOTOR (TYPE I)	
353	3-708-462-01	LENS ASSY (B)(TYPE I)	
354	3-708-386-01	SCREW, DOCKING (TYPE I)	
355	3-708-331-01	SENSOR ASSY, RESET (TYPE I)	
356	3-708-392-01	SCREW, FITTING, FI BOARD (TYPE I)	
357	3-707-501-01	SCREW, (Z) MOTOR FITTING (TYPE I)	
358	3-708-395-01	CHASSIS, RELAY FLEXIBLE (TYPE I)	
359	3-708-393-01	POTENTIAL, ZOOM (TYPE I)	
360	3-708-394-01	SCREW, FITTING, ZOOM POTENTIAL (TYPE I)	

Ref. No.	Part No.	Description	Remark
361	1-547-561-21	LENS, ZOOM (VCL-6110WC)(TYPE II)	
362	3-708-488-01	P.C.B ASSY, MAIN (TYPE II)	
363	3-708-490-01	PHOTO INTERRUPTER (FOCUS END)(TYPE II)	
364	3-708-485-01	ENCODER, ZOOM (TYPE II)	
M904	3-708-385-01	IRIS ASSY (TYPE I)	
M904	3-708-486-01	METER ASSY, IG (IRIS)(TYPE II)	
M905	3-708-389-01	MOTOR ASSY, FOCUS (TYPE I)	
M905	3-708-489-01	MOTOR ASSY, AF (FOCUS)(TYPE II)	
M906	3-708-387-01	MOTOR ASSY, ZOOM (TYPE I)	
M906	3-708-487-01	MOTOR ASSY, PZ (ZOOM)(TYPE II)	

SECTION 6
ELECTRICAL PARTS LIST

NOTE:

The components identified by mark ⚠ or dotted line with mark ⚠ are critical for safety.
Replace only with part number specified.

When indicating parts by reference number, please include the board name.

- Due to standardization, replacements in the parts list may be different from the parts specified in the diagrams or the components used on the set.
- -XX, -X mean standardized parts, so they may have some difference from the original one.
- RESISTORS
  All resistors are in ohms
  METAL: Metal-film resistor
  METAL OXIDE: Metal Oxide-film resistor
  F : nonflammable
- Hardware (# mark) list is given in the last of this parts list.
- Items marked "*" are not stocked since they are seldom required for routine service. Some delay should be anticipated when ordering these items.
- SEMICONDUCTORS
  In each case, u: μ , for example:
  uA...: μA..., uPA...: μPA...,
  uPB...: μPB..., uPC...: μPC...,
  uPD...: μPD...
- CAPACITORS
  uF : μF
- COILS
  uH : μH

Ref. No.	Part No.	Description	Remark
*	A-7063-123-A	CD-76 BOARD, COMPLETE ************************ (Ref.No 1,000 Series)	
		(CAPACITOR)	
C901	1-135-214-21	TANTAL. CHIP 4.7uF 20% 20V	
C902	1-128-013-11	ELECT CHIP 1uF 20% 50V	
C903	1-128-008-11	ELECT CHIP 3.3uF 20% 35V	
C904	1-162-964-11	CERAMIC CHIP 0.001uF 10% 50V	
C905	1-162-637-11	CERAMIC CHIP 0.47uF 16V	
C906	1-126-607-11	ELECT CHIP 47uF 20% 4V	
C907	1-128-004-11	ELECT CHIP 10uF 20% 16V	
C908	1-128-007-11	ELECT CHIP 2.2uF 20% 35V	
C909	1-162-974-11	CERAMIC CHIP 0.01uF 50V	
C910	1-164-156-11	CERAMIC CHIP 0.1uF 25V	
C911	1-164-156-11	CERAMIC CHIP 0.1uF 25V	
C912	1-162-974-11	CERAMIC CHIP 0.01uF 50V	
		(CONNECTOR)	
CN901	1-573-372-21	CONNECTOR, BOARD TO BOARD 18P	
CN902	1-566-537-11	CONNECTOR, FPC (NON ZIF) 5P	
		(DIODE)	
D901	8-719-820-05	DIODE 1SS181	
D903	8-719-820-05	DIODE 1SS181	
D904	8-719-800-76	DIODE 1SS226	
		(COIL)	
L901	1-412-032-11	INDUCTOR CHIP 100uH	
		(TRANSISTOR)	
Q901	8-729-602-21	TRANSISTOR 2SC4154-F	
Q902	8-729-402-13	TRANSISTOR XN1501	
Q903	8-729-232-86	TRANSISTOR 2SK1875	
		(RESISTOR)	
R901	1-216-845-11	METAL CHIP 100K 5% 1/16W	
R902	1-216-857-11	METAL CHIP 1M 5% 1/16W	
R903	1-216-839-11	METAL CHIP 33K 5% 1/16W	
R904	1-216-843-11	METAL CHIP 68K 5% 1/16W	
R905	1-216-849-11	METAL CHIP 220K 5% 1/16W	
R906	1-216-819-11	METAL CHIP 680 5% 1/16W	
R907	1-216-835-11	METAL CHIP 15K 5% 1/16W	
R908	1-216-850-11	METAL CHIP 270K 5% 1/16W	
R909	1-216-833-11	METAL CHIP 10K 5% 1/16W	
R910	1-216-809-11	METAL CHIP 100 5% 1/16W	
R911	1-216-828-11	METAL CHIP 3.9K 5% 1/16W	
R913	1-216-864-11	METAL CHIP 0 5% 1/16W	
R914	1-216-824-11	METAL CHIP 1.8K 5% 1/16W	
R915	1-216-824-11	METAL CHIP 1.8K 5% 1/16W	
R916	1-216-829-11	METAL CHIP 4.7K 5% 1/16W	
R917	1-216-821-11	METAL CHIP 1K 5% 1/16W	
R921	1-216-829-11	METAL CHIP 4.7K 5% 1/16W	
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*	A-7071-582-A	CK-56 BOARD, COMPLETE ************************ (Ref.No 7,000 Series)	
		(CAPACITOR)	
C561	1-164-506-11	CERAMIC CHIP 4.7uF 16V	
		(CONNECTOR)	
* CN562	1-580-756-21	PIN, CONNECTOR 7P	
		(DIODE)	
D525	8-719-420-14	DIODE MA8082-M	
D529	8-719-404-46	DIODE MA110	
D530	8-719-404-46	DIODE MA110	
D560	8-719-820-05	DIODE 1SS181	
D561	8-719-820-05	DIODE 1SS181	
D562	8-719-404-35	DIODE MA141WK	
		(COIL)	
L560	1-412-028-11	INDUCTOR CHIP 4.7uH	
		(SWITCH)	
S556	1-692-088-21	SWITCH, PUSH (HORIZONTAL TYPE) (TITLE MEMORY)	
S557	1-692-088-21	SWITCH, PUSH (HORIZONTAL TYPE) (COLOR MODE)	
S558	1-692-088-21	SWITCH, PUSH (HORIZONTAL TYPE) (SUPER IMPOSE)	
S559	1-572-938-21	SWITCH, TACTIL (FOCUS)	
S564	1-572-938-21	SWITCH, TACTIL (DATE)	
S565	1-572-938-21	SWITCH, TACTIL (TIME)	

Ref. No.	Part No.	Description	Remark
S566	1-572-938-21	SWITCH, TACTIL (AGE/EVENT)	
S567	1-572-938-21	SWITCH, TACTIL (BACK LIGHT)	
S568	1-571-275-31	SWITCH, SLIDE (AUTO LOCK)	
S569	1-572-938-21	SWITCH, TACTIL (PROGRAM AE)	
		(FLAT CABLE)	
W561	1-690-775-11	CABLE, FLAT (FFC-52) 20P	

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Ref. No.	Part No.	Description	Remark
*	A-7063-124-A	CS-35 BOARD, COMPLETE	
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		(Ref.No 1,000 Series)	
	X-3941-498-1	CASE (LID), SHIELD, CAMERA	
*	3-946-178-01	CASE (LID), SHIELD, RP	
*	3-946-179-01	CASE (MAIN), SHIELD, FE	
*	3-946-180-01	CASE (LID), SHIELD, FE	
*	3-948-499-01	CASE (MAIN), SHIELD, RP	
		(CAPACITOR)	
C001	1-162-974-11	CERAMIC CHIP 0.01uF 50V	
C002	1-162-974-11	CERAMIC CHIP 0.01uF 50V	
C003	1-128-004-11	ELECT CHIP 10uF 20% 16V	
C004	1-164-633-11	CERAMIC CHIP 0.1uF 10% 25V	
C005	1-164-156-11	CERAMIC CHIP 0.1uF 25V	
C006	1-164-633-11	CERAMIC CHIP 0.1uF 10% 25V	
C007	1-128-004-11	ELECT CHIP 10uF 20% 16V	
C008	1-164-633-11	CERAMIC CHIP 0.1uF 10% 25V	
C009	1-164-633-11	CERAMIC CHIP 0.1uF 10% 25V	
C010	1-164-633-11	CERAMIC CHIP 0.1uF 10% 25V	
C011	1-164-633-11	CERAMIC CHIP 0.1uF 10% 25V	
C012	1-162-974-11	CERAMIC CHIP 0.01uF 50V	
C013	1-162-974-11	CERAMIC CHIP 0.01uF 50V	
C014	1-128-004-11	ELECT CHIP 10uF 20% 16V	
C016	1-162-974-11	CERAMIC CHIP 0.01uF 50V	
C017	1-162-974-11	CERAMIC CHIP 0.01uF 50V	
C018	1-128-004-11	ELECT CHIP 10uF 20% 16V	
C019	1-162-974-11	CERAMIC CHIP 0.01uF 50V	
C020	1-164-156-11	CERAMIC CHIP 0.1uF 25V	
C021	1-162-974-11	CERAMIC CHIP 0.01uF 50V	
C022	1-164-156-11	CERAMIC CHIP 0.1uF 25V	
C023	1-162-974-11	CERAMIC CHIP 0.01uF 50V	
C024	1-164-156-11	CERAMIC CHIP 0.1uF 25V	
C025	1-128-004-11	ELECT CHIP 10uF 20% 16V	
C026	1-162-974-11	CERAMIC CHIP 0.01uF 50V	
C028	1-164-156-11	CERAMIC CHIP 0.1uF 25V	
C041	1-164-633-11	CERAMIC CHIP 0.1uF 10% 25V	
C042	1-162-953-11	CERAMIC CHIP 100PF 5% 50V	
C043	1-162-927-11	CERAMIC CHIP 100PF 5% 50V	
C044	1-162-927-11	CERAMIC CHIP 100PF 5% 50V	
C045	1-164-217-11	CERAMIC CHIP 150PF 5% 50V	
C046	1-164-156-11	CERAMIC CHIP 0.1uF 25V	

Ref. No.	Part No.	Description	Remark
C501	1-162-974-11	CERAMIC CHIP 0.01uF 50V	
C502	1-162-974-11	CERAMIC CHIP 0.01uF 50V	
C503	1-162-995-11	CERAMIC CHIP 0.022uF 50V	
C504	1-162-995-11	CERAMIC CHIP 0.022uF 50V	
C505	1-162-964-11	CERAMIC CHIP 0.001uF 10% 50V	
C506	1-162-964-11	CERAMIC CHIP 0.001uF 10% 50V	
C507	1-162-995-11	CERAMIC CHIP 0.022uF 50V	
C508	1-162-995-11	CERAMIC CHIP 0.022uF 50V	
C509	1-128-004-11	ELECT CHIP 10uF 20% 16V	
C510	1-162-995-11	CERAMIC CHIP 0.022uF 50V	
C511	1-162-974-11	CERAMIC CHIP 0.01uF 50V	
C512	1-164-173-11	CERAMIC CHIP 0.0039uF 10% 50V	
C513	1-162-964-11	CERAMIC CHIP 0.001uF 10% 50V	
C514	1-162-995-11	CERAMIC CHIP 0.022uF 50V	
C515	1-128-004-11	ELECT CHIP 10uF 20% 16V	
C517	1-128-004-11	ELECT CHIP 10uF 20% 16V	
C518	1-162-995-11	CERAMIC CHIP 0.022uF 50V	
C519	1-128-004-11	ELECT CHIP 10uF 20% 16V	
C520	1-164-489-11	CERAMIC CHIP 0.22uF 10% 16V	
C521	1-163-809-11	CERAMIC CHIP 0.047uF 10% 25V	
C522	1-162-970-11	CERAMIC CHIP 0.01uF 10% 25V	
C523	1-162-965-11	CERAMIC CHIP 0.0015uF 10% 50V	
C524	1-163-809-11	CERAMIC CHIP 0.047uF 10% 25V	
C525	1-164-227-11	CERAMIC CHIP 0.022uF 10% 25V	
C526	1-162-995-11	CERAMIC CHIP 0.022uF 50V	
C527	1-163-035-00	CERAMIC CHIP 0.047uF 50V	
C528	1-128-006-11	ELECT CHIP 4.7uF 20% 25V	
C529	1-162-974-11	CERAMIC CHIP 0.01uF 50V	
C530	1-162-918-11	CERAMIC CHIP 18PF 5% 50V	
C531	1-162-917-11	CERAMIC CHIP 15PF 5% 50V	
C532	1-162-905-11	CERAMIC CHIP 1PF 0.25PF50V	
C534	1-162-995-11	CERAMIC CHIP 0.022uF 50V	
C535	1-128-004-11	ELECT CHIP 10uF 20% 16V	
C536	1-128-004-11	ELECT CHIP 10uF 20% 16V	
C538	1-164-156-11	CERAMIC CHIP 0.1uF 25V	
C540	1-164-156-11	CERAMIC CHIP 0.1uF 25V	
C541	1-126-204-11	ELECT CHIP 47uF 20% 16V	
C542	1-164-156-11	CERAMIC CHIP 0.1uF 25V	
C543	1-164-107-11	CERAMIC CHIP 0.15uF 10% 16V	
C544	1-164-107-11	CERAMIC CHIP 0.15uF 10% 16V	
C546	1-128-008-11	ELECT CHIP 3.3uF 20% 35V	
C547	1-164-633-11	CERAMIC CHIP 0.1uF 10% 25V	
C548	1-164-633-11	CERAMIC CHIP 0.1uF 10% 25V	
C549	1-162-967-11	CERAMIC CHIP 0.0033uF 10% 50V	
C550	1-162-967-11	CERAMIC CHIP 0.0033uF 10% 50V	
C551	1-162-967-11	CERAMIC CHIP 0.0033uF 10% 50V	
C552	1-162-970-11	CERAMIC CHIP 0.01uF 10% 25V	
C553	1-163-038-00	CERAMIC CHIP 0.1uF 25V	
C554	1-164-222-11	CERAMIC CHIP 0.22uF 25V	
C555	1-164-222-11	CERAMIC CHIP 0.22uF 25V	

Ref.No.	Part No.	Description				Remark
C556	1-162-995-11	CERAMIC CHIP	0.022uF		50V	
C558	1-164-156-11	CERAMIC CHIP	0.1uF		25V	
C559	1-126-397-11	ELECT	33uF	20%	25V	
C560	1-128-004-11	ELECT CHIP	10uF	20%	16V	
C561	1-162-995-11	CERAMIC CHIP	0.022uF		50V	
C562	1-162-995-11	CERAMIC CHIP	0.022uF		50V	
C563	1-162-971-11	CERAMIC CHIP	0.001uF		50V	
C564	1-162-920-11	CERAMIC CHIP	27PF	5%	50V	
C565	1-164-156-11	CERAMIC CHIP	0.1uF		25V	
C566	1-162-917-11	CERAMIC CHIP	15PF	5%	50V	
C567	1-164-156-11	CERAMIC CHIP	0.1uF		25V	
C568	1-128-006-11	ELECT CHIP	4.7uF	20%	25V	
C569	1-164-337-11	CERAMIC CHIP	2.2uF		16V	
C570	1-162-962-11	CERAMIC CHIP	470PF	10%	50V	
C571	1-162-961-11	CERAMIC CHIP	330PF	10%	50V	
C572	1-164-156-11	CERAMIC CHIP	0.1uF		25V	
C573	1-162-974-11	CERAMIC CHIP	0.01uF		50V	
C574	1-162-970-11	CERAMIC CHIP	0.01uF	10%	25V	
C575	1-162-974-11	CERAMIC CHIP	0.01uF		50V	
C576	1-128-004-11	ELECT CHIP	10uF	20%	16V	
C577	1-162-927-11	CERAMIC CHIP	100PF	5%	50V	
C578	1-164-222-11	CERAMIC CHIP	0.22uF		25V	
C579	1-128-004-11	ELECT CHIP	10uF	20%	16V	
C580	1-162-974-11	CERAMIC CHIP	0.01uF		50V	
C582	1-162-964-11	CERAMIC CHIP	0.001uF	10%	50V	
C583	1-128-004-11	ELECT CHIP	10uF	20%	16V	
C584	1-128-004-11	ELECT CHIP	10uF	20%	16V	
C586	1-162-918-11	CERAMIC CHIP	18PF	5%	50V	
C587	1-162-921-11	CERAMIC CHIP	33PF	5%	50V	
C588	1-162-964-11	CERAMIC CHIP	0.001uF	10%	50V	
C589	1-164-633-11	CERAMIC CHIP	0.1uF	10%	25V	
C590	1-162-964-11	CERAMIC CHIP	0.001uF	10%	50V	
C591	1-162-969-11	CERAMIC CHIP	0.0068uF	10%	25V	
C592	1-162-969-11	CERAMIC CHIP	0.0068uF	10%	25V	
C593	1-163-809-11	CERAMIC CHIP	0.047uF	10%	25V	
C594	1-162-970-11	CERAMIC CHIP	0.01uF	10%	25V	
C595	1-162-974-11	CERAMIC CHIP	0.01uF		50V	
C701	1-135-149-21	TANTALUM CHIP	2.2uF	20%	10V	
C702	1-164-633-11	CERAMIC CHIP	0.1uF	10%	25V	
C703	1-162-974-11	CERAMIC CHIP	0.01uF		50V	
C705	1-164-156-11	CERAMIC CHIP	0.1uF		25V	
C706	1-164-633-11	CERAMIC CHIP	0.1uF	10%	25V	
C707	1-162-974-11	CERAMIC CHIP	0.01uF		50V	
C708	1-162-974-11	CERAMIC CHIP	0.01uF		50V	
C709	1-164-346-11	CERAMIC CHIP	1uF		16V	
C710	1-162-974-11	CERAMIC CHIP	0.01uF		50V	
C711	1-135-181-21	TANTALUM CHIP	4.7uF	20%	6.3V	
C712	1-164-156-11	CERAMIC CHIP	0.1uF		25V	
C713	1-163-077-00	CERAMIC CHIP	0.1uF	10%	25V	
C714	1-164-156-11	CERAMIC CHIP	0.1uF		25V	

Ref.No.	Part No.	Description				Remark
C717	1-135-259-11	TANTAL. CHIP	10uF	20%	6.3V	
C718	1-164-156-11	CERAMIC CHIP	0.1uF		25V	
C719	1-162-974-11	CERAMIC CHIP	0.01uF		50V	
C721	1-164-156-11	CERAMIC CHIP	0.1uF		25V	
C722	1-162-974-11	CERAMIC CHIP	0.01uF		50V	
C724	1-162-974-11	CERAMIC CHIP	0.01uF		50V	
C725	1-135-181-21	TANTALUM CHIP	4.7uF	20%	6.3V	
C726	1-164-156-11	CERAMIC CHIP	0.1uF		25V	
C729	1-164-156-11	CERAMIC CHIP	0.1uF		25V	
C731	1-135-259-11	TANTAL. CHIP	10uF	20%	6.3V	
C733	1-164-156-11	CERAMIC CHIP	0.1uF		25V	
C736	1-162-974-11	CERAMIC CHIP	0.01uF		50V	
C737	1-135-181-21	TANTALUM CHIP	4.7uF	20%	6.3V	
C738	1-164-156-11	CERAMIC CHIP	0.1uF		25V	
C739	1-162-974-11	CERAMIC CHIP	0.01uF		50V	
C741	1-164-156-11	CERAMIC CHIP	0.1uF		25V	
C743	1-162-974-11	CERAMIC CHIP	0.01uF		50V	
C744	1-162-638-11	CERAMIC CHIP	1uF		16V	
C745	1-162-974-11	CERAMIC CHIP	0.01uF		50V	
C747	1-164-156-11	CERAMIC CHIP	0.1uF		25V	
C748	1-163-077-00	CERAMIC CHIP	0.1uF	10%	25V	
C749	1-135-181-21	TANTALUM CHIP	4.7uF	20%	6.3V	
C750	1-164-156-11	CERAMIC CHIP	0.1uF		25V	
C751	1-162-974-11	CERAMIC CHIP	0.01uF		50V	
C752	1-164-156-11	CERAMIC CHIP	0.1uF		25V	
C753	1-162-974-11	CERAMIC CHIP	0.01uF		50V	
C754	1-162-943-11	CERAMIC CHIP	15PF	5%	50V	
C756	1-162-974-11	CERAMIC CHIP	0.01uF		50V	
C801	1-135-259-11	TANTAL. CHIP	10uF	20%	6.3V	
C802	1-162-917-11	CERAMIC CHIP	15PF	5%	50V	
C803	1-135-181-21	TANTALUM CHIP	4.7uF	20%	6.3V	
C804	1-162-974-11	CERAMIC CHIP	0.01uF		50V	
C805	1-162-974-11	CERAMIC CHIP	0.01uF		50V	
C806	1-162-964-11	CERAMIC CHIP	0.001uF	10%	50V	
C807	1-162-974-11	CERAMIC CHIP	0.01uF		50V	
C808	1-135-091-00	TANTALUM CHIP	1uF	20%	16V	
C809	1-135-181-21	TANTALUM CHIP	4.7uF	20%	6.3V	
C810	1-163-077-00	CERAMIC CHIP	0.1uF	10%	25V	
C811	1-164-156-11	CERAMIC CHIP	0.1uF		25V	
C813	1-164-156-11	CERAMIC CHIP	0.1uF		25V	
C814	1-162-964-11	CERAMIC CHIP	0.001uF	10%	50V	
C815	1-135-181-21	TANTALUM CHIP	4.7uF	20%	6.3V	
C816	1-162-974-11	CERAMIC CHIP	0.01uF		50V	
C817	1-162-974-11	CERAMIC CHIP	0.01uF		50V	
C818	1-135-091-00	TANTALUM CHIP	1uF	20%	16V	
C819	1-164-156-11	CERAMIC CHIP	0.1uF		25V	
C820	1-135-091-00	TANTALUM CHIP	1uF	20%	16V	
C821	1-162-947-11	CERAMIC CHIP	33PF	5%	50V	
C823	1-135-091-00	TANTALUM CHIP	1uF	20%	16V	
C826	1-164-156-11	CERAMIC CHIP	0.1uF		25V	

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Ref. No.	Part No.	Description				Remark
C828	1-163-077-00	CERAMIC CHIP	0.1uF	10%	25V	
C831	1-163-077-00	CERAMIC CHIP	0.1uF	10%	25V	
C832	1-162-964-11	CERAMIC CHIP	0.001uF	10%	50V	
C833	1-162-974-11	CERAMIC CHIP	0.01uF		50V	
C834	1-163-077-00	CERAMIC CHIP	0.1uF	10%	25V	
C835	1-162-974-11	CERAMIC CHIP	0.01uF		50V	
C836	1-126-205-11	ELECT CHIP	47uF	20%	6.3V	
C837	1-162-974-11	CERAMIC CHIP	0.01uF		50V	
C838	1-135-145-11	TANTALUM CHIP	0.47uF	10%	35V	
C839	1-162-974-11	CERAMIC CHIP	0.01uF		50V	
C840	1-164-337-11	CERAMIC CHIP	2.2uF		16V	
C851	1-164-633-11	CERAMIC CHIP	0.1uF	10%	25V	
C852	1-162-964-11	CERAMIC CHIP	0.001uF	10%	50V	
C853	1-162-638-11	CERAMIC CHIP	1uF		16V	
C854	1-162-974-11	CERAMIC CHIP	0.01uF		50V	
C855	1-164-156-11	CERAMIC CHIP	0.1uF		25V	
C856	1-162-974-11	CERAMIC CHIP	0.01uF		50V	
C857	1-164-156-11	CERAMIC CHIP	0.1uF		25V	
C858	1-162-974-11	CERAMIC CHIP	0.01uF		50V	
C859	1-128-004-11	ELECT CHIP	10uF	20%	16V	
C861	1-162-974-11	CERAMIC CHIP	0.01uF		50V	
C862	1-162-974-11	CERAMIC CHIP	0.01uF		50V	
C863	1-162-974-11	CERAMIC CHIP	0.01uF		50V	
C864	1-162-638-11	CERAMIC CHIP	1uF		16V	
C865	1-126-205-11	ELECT CHIP	47uF	20%	6.3V	
C866	1-164-156-11	CERAMIC CHIP	0.1uF		25V	
C868	1-164-156-11	CERAMIC CHIP	0.1uF		25V	
C869	1-164-005-11	CERAMIC CHIP	0.47uF		25V	
C870	1-164-173-11	CERAMIC CHIP	0.0039uF	10%	50V	
C872	1-162-638-11	CERAMIC CHIP	1uF		16V	
C875	1-135-259-11	TANTAL. CHIP	10uF	20%	6.3V	
		(CONNECTOR)				
CN001	1-569-775-21	PIN, CONNECTOR 5P				
CN002	1-691-492-21	CONNECTOR, FFC/FPC 13P				
CN501	1-691-520-11	CONNECTOR, BOARD TO BOARD 48P				
CN502	1-691-539-11	CONNECTOR, BOARD TO BOARD 30P				
CN503	1-691-530-11	CONNECTOR, BOARD TO BOARD 40P				
CN504	1-691-528-11	CONNECTOR, BOARD TO BOARD 28P				
CN505	1-691-495-21	CONNECTOR, FFC/FPC 16P				
CN506	1-573-326-11	CONNECTOR, BOARD TO BOARD 24P				
CN507	1-691-494-21	CONNECTOR, FFC/FPC 15P				
CN701	1-573-372-21	CONNECTOR, BOARD TO BOARD 18P				
CN801	1-691-475-21	CONNECTOR, BOARD TO BOARD 18P				
CN851	1-573-361-11	CONNECTOR, FFC/FPC 21P				
CN852	1-566-540-11	CONNECTOR, FPC (NON ZIF) 8P				
		(TRIMMER)				
CT801	1-141-356-11	CAP, ADJ	6PF			

Ref. No.	Part No.	Description		Remark
		(DIODE)		
⚠D501	8-719-421-27	DIODE	MA728	
D503	8-719-420-14	DIODE	MA8082-M	
D504	8-719-404-35	DIODE	MA141WK	
D505	8-719-420-14	DIODE	MA8082-M	
D507	8-719-404-46	DIODE	MA110	
		(FILTER)		
FL701	1-402-713-21	COIL, OSC (PAL)		
		(IC)		
IC001	8-752-033-38	IC	CXA1202R	
IC501	8-759-058-96	IC	TB1206F	
IC502	8-759-999-02	IC	TL1596CDB	
IC503	8-752-838-46	IC	CXP80624-410Q	
IC505	8-759-990-55	IC	CXA8006M	
IC506	8-759-083-36	IC	uPD75316GF-277-3B9	
IC507	8-759-511-22	IC	CXA1448N	
IC508	8-759-512-69	IC	S-81350HG-KD	
IC509	8-759-145-63	IC	uPD7564G-540	
IC510	8-759-039-01	IC	MPC1720M	
IC511	8-759-044-78	IC	AK6420F	
IC701	8-759-031-58	IC	SC7SU04F	
IC702	8-759-635-27	IC	M62352GP	
IC703	8-759-069-29	IC	uPD6456GS-618	
IC704	8-752-348-92	IC	CXD2101AR	
IC705	8-759-069-18	IC	CXD2103AR-T6	
IC706	8-752-337-36	IC	CXD2104N	
IC707	8-752-344-53	IC	CXD2100Q	
IC709	8-752-837-59	IC	CXP80624-299Q	
IC710	8-759-519-14	IC	MB8464-15LLPFTN	
IC711	8-759-518-81	IC	CXD2112R	
IC712	8-759-044-78	IC	AK6420F	
IC801	8-752-350-84	IC	CXD1257AR-T5	
IC802	8-752-056-39	IC	CXA1507BR	
IC803	8-752-053-26	IC	CXA1399Q	
IC804	8-752-327-48	IC	CXD1250N	
IC805	8-752-054-61	IC	CXA1390AR	
IC851	8-759-701-24	IC	NJM3414M-TE1	
IC852	8-759-998-96	IC	LM324D	
IC853	8-759-038-81	IC	MPC1724M	
IC854	8-759-823-51	IC	LB1830M	
IC855	8-759-998-98	IC	LM358D	
		(COIL)		
L001	1-412-033-11	INDUCTOR CHIP	220uH	
L002	1-412-033-11	INDUCTOR CHIP	220uH	
L003	1-412-033-11	INDUCTOR CHIP	220uH	
L004	1-412-029-11	INDUCTOR CHIP	10uH	
L041	1-412-033-11	INDUCTOR CHIP	220uH	

The components identified by mark ⚠ or dotted line with mark ⚠ are critical for safety.
Replace only with part number specified.

Ref. No.	Part No.	Description	Remark
L042	1-412-788-41	INDUCTOR 10uH	
L501	1-412-029-11	INDUCTOR CHIP 10uH	
L502	1-412-029-11	INDUCTOR CHIP 10uH	
L503	1-412-028-11	INDUCTOR CHIP 4.7uH	
L504	1-412-028-11	INDUCTOR CHIP 4.7uH	
L506	1-412-029-11	INDUCTOR CHIP 10uH	
L701	1-412-006-31	INDUCTOR CHIP 10uH	
L702	1-412-006-31	INDUCTOR CHIP 10uH	
L703	1-412-006-31	INDUCTOR CHIP 10uH	
L704	1-412-006-31	INDUCTOR CHIP 10uH	
L705	1-412-006-31	INDUCTOR CHIP 10uH	
L706	1-412-029-11	INDUCTOR CHIP 10uH	
L714	1-412-011-31	INDUCTOR CHIP 27uH	
L715	1-412-029-11	INDUCTOR CHIP 10uH	
L716	1-412-026-11	INDUCTOR CHIP 1uH	
L717	1-412-029-11	INDUCTOR CHIP 10uH	
L718	1-412-006-31	INDUCTOR CHIP 10uH	
L719	1-412-006-31	INDUCTOR CHIP 10uH	
L722	1-412-006-31	INDUCTOR CHIP 10uH	
L723	1-410-391-11	INDUCTOR CHIP 68uH	
L730	1-412-026-11	INDUCTOR CHIP 1uH	
L731	1-412-026-11	INDUCTOR CHIP 1uH	
L732	1-412-026-11	INDUCTOR CHIP 1uH	
L733	1-412-979-21	INDUCTOR 1uH	
L734	1-412-979-21	INDUCTOR 1uH	
L801	1-412-029-11	INDUCTOR CHIP 10uH	
L802	1-412-006-31	INDUCTOR CHIP 10uH	
L803	1-412-029-11	INDUCTOR CHIP 10uH	
L804	1-412-029-11	INDUCTOR CHIP 10uH	
L851	1-412-029-11	INDUCTOR CHIP 10uH	
L852	1-410-993-11	INDUCTOR CHIP 1uH	
L853	1-412-029-11	INDUCTOR CHIP 10uH	

(IC LINK)

Ref. No.	Part No.	Description	Remark
⚠PS501	1-576-123-21	LINK, IC (CCP2E20 0.8A)	

(TRANSISTOR)

Ref. No.	Part No.	Description	Remark
Q001	8-729-420-20	TRANSISTOR XN4312	
Q002	8-729-010-75	TRANSISTOR MSC4116-B/C	
Q003	8-729-905-12	TRANSISTOR DTA144EU	
Q041	8-729-010-60	TRANSISTOR MSA1586-BC	
Q043	8-729-216-22	TRANSISTOR 2SA1162-G	
Q501	8-729-907-00	TRANSISTOR DTC114EU	
Q502	8-729-402-78	TRANSISTOR XN6401	
Q503	8-729-010-75	TRANSISTOR MSC4116-B/C	
Q505	8-729-010-60	TRANSISTOR MSA1586-BC	
Q507	8-729-905-12	TRANSISTOR DTA144EU	
Q509	8-729-822-84	TRANSISTOR 2SB1202FAST	
Q510	8-729-402-81	TRANSISTOR XN4501	
Q511	8-729-402-81	TRANSISTOR XN4501	
Q512	8-729-010-75	TRANSISTOR MSC4116-B/C	
Q702	8-729-402-84	TRANSISTOR XN4601	
Q703	8-729-010-60	TRANSISTOR MSA1586-BC	
Q704	8-729-010-60	TRANSISTOR MSA1586-BC	
Q705	8-729-905-18	TRANSISTOR DTC144EU	
Q707	8-729-010-75	TRANSISTOR MSC4116-B/C	
Q708	8-729-920-XX	TRANSISTOR DTA114EUT106	
Q709	8-729-905-61	TRANSISTOR DTC124EU	
Q801	8-729-423-55	TRANSISTOR 2SC3931-D	
Q802	8-729-403-27	TRANSISTOR XN4401	
Q851	8-729-010-75	TRANSISTOR MSC4116-B/C	
Q853	8-729-403-27	TRANSISTOR XN4401	

(RESISTOR)

Ref. No.	Part No.	Description	Remark
R001	1-216-823-11	METAL CHIP 1.5K 5% 1/16W	
R003	1-216-837-11	METAL CHIP 22K 5% 1/16W	
R004	1-216-838-11	METAL CHIP 27K 5% 1/16W	
R005	1-216-835-11	METAL CHIP 15K 5% 1/16W	
R006	1-216-791-11	METAL CHIP 3.3 5% 1/16W	
R007	1-216-838-11	METAL CHIP 27K 5% 1/16W	
R008	1-216-838-11	METAL CHIP 27K 5% 1/16W	
R009	1-216-841-11	METAL CHIP 47K 5% 1/16W	
R011	1-216-838-11	METAL CHIP 27K 5% 1/16W	
R012	1-216-837-11	METAL CHIP 22K 5% 1/16W	
R013	1-216-823-11	METAL CHIP 1.5K 5% 1/16W	
R014	1-216-791-11	METAL CHIP 3.3 5% 1/16W	
R015	1-216-841-11	METAL CHIP 47K 5% 1/16W	
R016	1-216-832-11	METAL CHIP 8.2K 5% 1/16W	
R017	1-216-837-11	METAL CHIP 22K 5% 1/16W	
R018	1-216-832-11	METAL CHIP 8.2K 5% 1/16W	
R019	1-216-822-11	METAL CHIP 1.2K 5% 1/16W	
R020	1-216-830-11	METAL CHIP 5.6K 5% 1/16W	
R021	1-216-828-11	METAL CHIP 3.9K 5% 1/16W	
R022	1-216-864-11	METAL CHIP 0 5% 1/16W	
R023	1-216-821-11	METAL CHIP 1K 5% 1/16W	
R024	1-216-815-11	METAL CHIP 330 5% 1/16W	
R025	1-216-830-11	METAL CHIP 5.6K 5% 1/16W	
R026	1-216-817-11	METAL CHIP 470 5% 1/16W	
R041	1-216-837-11	METAL CHIP 22K 5% 1/16W	
R042	1-216-839-11	METAL CHIP 33K 5% 1/16W	
R043	1-216-815-11	METAL CHIP 330 5% 1/16W	
R044	1-216-817-11	METAL CHIP 470 5% 1/16W	
R046	1-216-801-11	METAL CHIP 22 5% 1/16W	
R047	1-216-818-11	METAL CHIP 560 5% 1/16W	
R501	1-216-839-11	METAL CHIP 33K 5% 1/16W	
R502	1-216-837-11	METAL CHIP 22K 5% 1/16W	
R503	1-216-837-11	METAL CHIP 22K 5% 1/16W	
R504	1-216-845-11	METAL CHIP 100K 5% 1/16W	
R505	1-216-817-11	METAL CHIP 470 5% 1/16W	
R506	1-216-852-11	METAL CHIP 390K 5% 1/16W	

The components identified by mark ⚠ or dotted line with mark ⚠ are critical for safety.
Replace only with part number specified.

Ref. No.	Part No.	Description				Remark
R507	1-216-849-11	METAL CHIP	220K	5%	1/16W	
R508	1-218-863-11	METAL CHIP	4.7K	0.50%	1/16W	
R509	1-218-873-11	METAL CHIP	12K	0.50%	1/16W	
R510	1-216-845-11	METAL CHIP	100K	5%	1/16W	
R511	1-216-833-11	METAL CHIP	10K	5%	1/16W	
R512	1-216-829-11	METAL CHIP	4.7K	5%	1/16W	
R513	1-216-845-11	METAL CHIP	100K	5%	1/16W	
R514	1-216-857-11	METAL CHIP	1M	5%	1/16W	
R515	1-216-841-11	METAL CHIP	47K	5%	1/16W	
R516	1-216-841-11	METAL CHIP	47K	5%	1/16W	
R517	1-216-833-11	METAL CHIP	10K	5%	1/16W	
R520	1-216-833-11	METAL CHIP	10K	5%	1/16W	
R521	1-216-841-11	METAL CHIP	47K	5%	1/16W	
R522	1-216-833-11	METAL CHIP	10K	5%	1/16W	
R523	1-216-833-11	METAL CHIP	10K	5%	1/16W	
R524	1-216-845-11	METAL CHIP	100K	5%	1/16W	
R526	1-216-821-11	METAL CHIP	1K	5%	1/16W	
R527	1-216-295-00	METAL CHIP	0	5%	1/10W	
R528	1-216-295-00	METAL CHIP	0	5%	1/10W	
R530	1-216-813-11	METAL CHIP	220	5%	1/16W	
R530	1-216-864-11	METAL CHIP	0	5%	1/16W	
R531	1-216-864-11	METAL CHIP	0	5%	1/16W	
R532	1-216-833-11	METAL CHIP	10K	5%	1/16W	
R533	1-216-827-11	METAL CHIP	3.3K	5%	1/16W	
R534	1-216-821-11	METAL CHIP	1K	5%	1/16W	
R536	1-216-821-11	METAL CHIP	1K	5%	1/16W	
R537	1-216-845-11	METAL CHIP	100K	5%	1/16W	
R538	1-216-833-11	METAL CHIP	10K	5%	1/16W	
R539	1-216-821-11	METAL CHIP	1K	5%	1/16W	
R540	1-216-837-11	METAL CHIP	22K	5%	1/16W	
R541	1-216-824-11	METAL CHIP	1.8K	5%	1/16W	
R542	1-216-821-11	METAL CHIP	1K	5%	1/16W	
R543	1-216-831-11	METAL CHIP	6.8K	5%	1/16W	
R544	1-216-815-11	METAL CHIP	330	5%	1/16W	
R545	1-216-039-00	METAL CHIP	390	5%	1/10W	
R546	1-216-864-11	METAL CHIP	0	5%	1/16W	
R547	1-216-827-11	METAL CHIP	3.3K	5%	1/16W	
R548	1-216-833-11	METAL CHIP	10K	5%	1/16W	
R549	1-217-671-11	METAL CHIP	1	5%	1/10W	
R550	1-217-671-11	METAL CHIP	1	5%	1/10W	
R551	1-217-671-11	METAL CHIP	1	5%	1/10W	
R552	1-217-671-11	METAL CHIP	1	5%	1/10W	
R553	1-216-845-11	METAL CHIP	100K	5%	1/16W	
R555	1-216-838-11	METAL CHIP	27K	5%	1/16W	
R556	1-216-821-11	METAL CHIP	1K	5%	1/16W	
R557	1-216-838-11	METAL CHIP	27K	5%	1/16W	
R558	1-216-821-11	METAL CHIP	1K	5%	1/16W	
R559	1-216-838-11	METAL CHIP	27K	5%	1/16W	
R560	1-216-864-11	METAL CHIP	0	5%	1/16W	
R562	1-216-833-11	METAL CHIP	10K	5%	1/16W	
R563	1-216-833-11	METAL CHIP	10K	5%	1/16W	
R564	1-216-851-11	METAL CHIP	330K	5%	1/16W	
R565	1-216-837-11	METAL CHIP	22K	5%	1/16W	
R566	1-216-841-11	METAL CHIP	47K	5%	1/16W	
R568	1-216-833-11	METAL CHIP	10K	5%	1/16W	
R569	1-216-817-11	METAL CHIP	470	5%	1/16W	
R570	1-216-845-11	METAL CHIP	100K	5%	1/16W	
R571	1-216-829-11	METAL CHIP	4.7K	5%	1/16W	
R572	1-216-821-11	METAL CHIP	1K	5%	1/16W	
R573	1-216-861-11	METAL CHIP	2.2M	5%	1/16W	
R574	1-216-821-11	METAL CHIP	1K	5%	1/16W	
R575	1-216-851-11	METAL CHIP	330K	5%	1/16W	
R576	1-216-864-11	METAL CHIP	0	5%	1/16W	
R577	1-216-821-11	METAL CHIP	1K	5%	1/16W	
R578	1-216-841-11	METAL CHIP	47K	5%	1/16W	
R579	1-216-829-11	METAL CHIP	4.7K	5%	1/16W	
R580	1-216-845-11	METAL CHIP	100K	5%	1/16W	
R582	1-216-821-11	METAL CHIP	1K	5%	1/16W	
R583	1-216-821-11	METAL CHIP	1K	5%	1/16W	
R584	1-216-833-11	METAL CHIP	10K	5%	1/16W	
R587	1-216-841-11	METAL CHIP	47K	5%	1/16W	
R589	1-216-845-11	METAL CHIP	100K	5%	1/16W	
R590	1-216-831-11	METAL CHIP	6.8K	5%	1/16W	
R591	1-216-845-11	METAL CHIP	100K	5%	1/16W	
R592	1-216-845-11	METAL CHIP	100K	5%	1/16W	
R594	1-216-833-11	METAL CHIP	10K	5%	1/16W	
R596	1-216-864-11	METAL CHIP	0	5%	1/16W	
R600	1-216-809-11	METAL CHIP	100	5%	1/16W	
R601	1-216-826-11	METAL CHIP	2.7K	5%	1/16W	
R603	1-216-845-11	METAL CHIP	100K	5%	1/16W	
R606	1-216-841-11	METAL CHIP	47K	5%	1/16W	
R607	1-216-295-00	METAL CHIP	0	5%	1/10W	
R608	1-216-295-00	METAL CHIP	0	5%	1/10W	
R609	1-216-821-11	METAL CHIP	1K	5%	1/16W	
R611	1-216-864-11	METAL CHIP	0	5%	1/16W	
R613	1-216-841-11	METAL CHIP	47K	5%	1/16W	
R614	1-216-841-11	METAL CHIP	47K	5%	1/16W	
R615	1-216-835-11	METAL CHIP	15K	5%	1/16W	
R701	1-216-857-11	METAL CHIP	1M	5%	1/16W	
R702	1-216-821-11	METAL CHIP	1K	5%	1/16W	
R703	1-216-837-11	METAL CHIP	22K	5%	1/16W	
R704	1-216-815-11	METAL CHIP	330	5%	1/16W	
R705	1-216-833-11	METAL CHIP	10K	5%	1/16W	
R706	1-216-825-11	METAL CHIP	2.2K	5%	1/16W	
R707	1-216-825-11	METAL CHIP	2.2K	5%	1/16W	
R708	1-216-845-11	METAL CHIP	100K	5%	1/16W	
R709	1-216-839-11	METAL CHIP	33K	5%	1/16W	
R710	1-216-857-11	METAL CHIP	1M	5%	1/16W	
R711	1-216-864-11	METAL CHIP	0	5%	1/16W	
R712	1-216-821-11	METAL CHIP	1K	5%	1/16W	

Ref. No.	Part No.	Description				Remark
R713	1-216-821-11	METAL CHIP	1K	5%	1/16W	
R714	1-216-821-11	METAL CHIP	1K	5%	1/16W	
R715	1-216-821-11	METAL CHIP	1K	5%	1/16W	
R716	1-216-863-11	METAL GLAZE	3.3M	5%	1/16W	
R717	1-216-864-11	METAL CHIP	0	5%	1/16W	
R718	1-216-825-11	METAL CHIP	2.2K	5%	1/16W	
R719	1-216-840-11	METAL CHIP	39K	5%	1/16W	
R721	1-216-821-11	METAL CHIP	1K	5%	1/16W	
R722	1-216-821-11	METAL CHIP	1K	5%	1/16W	
R723	1-216-833-11	METAL CHIP	10K	5%	1/16W	
R724	1-216-821-11	METAL CHIP	1K	5%	1/16W	
R725	1-216-821-11	METAL CHIP	1K	5%	1/16W	
R726	1-216-821-11	METAL CHIP	1K	5%	1/16W	
R727	1-216-821-11	METAL CHIP	1K	5%	1/16W	
R728	1-216-821-11	METAL CHIP	1K	5%	1/16W	
R729	1-216-821-11	METAL CHIP	1K	5%	1/16W	
R732	1-216-821-11	METAL CHIP	1K	5%	1/16W	
R733	1-216-822-11	METAL CHIP	1.2K	5%	1/16W	
R734	1-216-817-11	METAL CHIP	470	5%	1/16W	
R735	1-216-834-11	METAL CHIP	12K	5%	1/16W	
R736	1-216-827-11	METAL CHIP	3.3K	5%	1/16W	
R737	1-216-813-11	METAL CHIP	220	5%	1/16W	
R738	1-216-825-11	METAL CHIP	2.2K	5%	1/16W	
R739	1-216-833-11	METAL CHIP	10K	5%	1/16W	
R741	1-216-864-11	METAL CHIP	0	5%	1/16W	
R742	1-216-821-11	METAL CHIP	1K	5%	1/16W	
R745	1-216-827-11	METAL CHIP	3.3K	5%	1/16W	
R748	1-216-864-11	METAL CHIP	0	5%	1/16W	
R749	1-216-841-11	METAL CHIP	47K	5%	1/16W	
R750	1-216-864-11	METAL CHIP	0	5%	1/16W	
R752	1-216-816-11	METAL CHIP	390	5%	1/16W	
R753	1-216-834-11	METAL CHIP	12K	5%	1/16W	
R754	1-216-821-11	METAL CHIP	1K	5%	1/16W	
R755	1-216-833-11	METAL CHIP	10K	5%	1/16W	
R756	1-216-857-11	METAL CHIP	1M	5%	1/16W	
R757	1-216-857-11	METAL CHIP	1M	5%	1/16W	
R758	1-216-841-11	METAL CHIP	47K	5%	1/16W	
R759	1-216-821-11	METAL CHIP	1K	5%	1/16W	
R760	1-216-857-11	METAL CHIP	1M	5%	1/16W	
R761	1-216-864-11	METAL CHIP	0	5%	1/16W	
R763	1-216-833-11	METAL CHIP	10K	5%	1/16W	
R764	1-216-839-11	METAL CHIP	33K	5%	1/16W	
R765	1-216-814-11	METAL CHIP	270	5%	1/16W	
R766	1-216-833-11	METAL CHIP	10K	5%	1/16W	
R767	1-216-833-11	METAL CHIP	10K	5%	1/16W	
R768	1-216-837-11	METAL CHIP	22K	5%	1/16W	
R769	1-216-833-11	METAL CHIP	10K	5%	1/16W	
R770	1-216-825-11	METAL CHIP	2.2K	5%	1/16W	
R771	1-216-309-00	METAL CHIP	5.6	5%	1/10W	
R774	1-216-841-11	METAL CHIP	47K	5%	1/16W	

Ref. No.	Part No.	Description				Remark
R775	1-216-821-11	METAL CHIP	1K	5%	1/16W	
R777	1-216-833-11	METAL CHIP	10K	5%	1/16W	
R778	1-216-833-11	METAL CHIP	10K	5%	1/16W	
R783	1-216-825-11	METAL CHIP	2.2K	5%	1/16W	
R784	1-216-833-11	METAL CHIP	10K	5%	1/16W	
R785	1-216-833-11	METAL CHIP	10K	5%	1/16W	
R787	1-216-821-11	METAL CHIP	1K	5%	1/16W	
R788	1-216-825-11	METAL CHIP	2.2K	5%	1/16W	
R793	1-216-823-11	METAL CHIP	1.5K	5%	1/16W	
R794	1-216-841-11	METAL CHIP	47K	5%	1/16W	
R795	1-216-841-11	METAL CHIP	47K	5%	1/16W	
R796	1-216-825-11	METAL CHIP	2.2K	5%	1/16W	
R797	1-216-825-11	METAL CHIP	2.2K	5%	1/16W	
R799	1-216-821-11	METAL CHIP	1K	5%	1/16W	
R801	1-216-864-11	METAL CHIP	0	5%	1/16W	
R802	1-216-835-11	METAL CHIP	15K	5%	1/16W	
R804	1-216-833-11	METAL CHIP	10K	5%	1/16W	
R805	1-216-845-11	METAL CHIP	100K	5%	1/16W	
R808	1-216-801-11	METAL CHIP	22	5%	1/16W	
R810	1-216-825-11	METAL CHIP	2.2K	5%	1/16W	
R811	1-216-833-11	METAL CHIP	10K	5%	1/16W	
R812	1-216-825-11	METAL CHIP	2.2K	5%	1/16W	
R813	1-216-825-11	METAL CHIP	2.2K	5%	1/16W	
R814	1-216-823-11	METAL CHIP	1.5K	5%	1/16W	
R815	1-216-819-11	METAL CHIP	680	5%	1/16W	
R816	1-216-824-11	METAL CHIP	1.8K	5%	1/16W	
R819	1-216-805-11	METAL CHIP	47	5%	1/16W	
R823	1-218-876-11	METAL CHIP	16K	0.50%	1/16W	
R825	1-216-832-11	METAL CHIP	8.2K	5%	1/16W	
R826	1-216-837-11	METAL CHIP	22K	5%	1/16W	
R828	1-218-847-11	METAL CHIP	1K	0.50%	1/16W	
R836	1-216-863-11	METAL GLAZE	3.3M	5%	1/16W	
R851	1-216-837-11	METAL CHIP	22K	5%	1/16W	
R852	1-216-821-11	METAL CHIP	1K	5%	1/16W	
R853	1-216-828-11	METAL CHIP	3.9K	5%	1/16W	
R854	1-216-833-11	METAL CHIP	10K	5%	1/16W	
R855	1-216-826-11	METAL CHIP	2.7K	5%	1/16W	
R857	1-216-848-11	METAL CHIP	180K	5%	1/16W	
R858	1-216-837-11	METAL CHIP	22K	5%	1/16W	
R859	1-216-845-11	METAL CHIP	100K	5%	1/16W	
R860	1-216-833-11	METAL CHIP	10K	5%	1/16W	
R861	1-216-833-11	METAL CHIP	10K	5%	1/16W	
R862	1-216-848-11	METAL CHIP	180K	5%	1/16W	
R863	1-216-855-11	METAL CHIP	680K	5%	1/16W	
R864	1-216-833-11	METAL CHIP	10K	5%	1/16W	
R865	1-218-879-11	METAL CHIP	22K	0.50%	1/16W	
R866	1-216-820-11	METAL CHIP	820	5%	1/16W	
R867	1-216-837-11	METAL CHIP	22K	5%	1/16W	
R868	1-216-833-11	METAL CHIP	10K	5%	1/16W	
R869	1-218-744-11	METAL CHIP	150K	0.50%	1/16W	

Ref. No.	Part No.	Description	Remark
R870	1-216-841-11	METAL CHIP 47K 5% 1/16W	
R871	1-218-871-11	METAL CHIP 10K 0.50% 1/16W	
R872	1-216-851-11	METAL CHIP 330K 5% 1/16W	
R873	1-216-816-11	METAL CHIP 390 5% 1/16W	
R874	1-216-842-11	METAL CHIP 56K 5% 1/16W	
R875	1-216-134-00	METAL CHIP 2.2 5% 1/8W	
R876	1-216-829-11	METAL CHIP 4.7K 5% 1/16W	
R877	1-218-881-11	METAL CHIP 27K 0.50% 1/16W	
R884	1-216-837-11	METAL CHIP 22K 5% 1/16W	
R885	1-216-827-11	METAL CHIP 3.3K 5% 1/16W	

(CONPOSITION CIRCUIT BLOCK)

Ref. No.	Part No.	Description	Remark
RB501	1-236-412-11	NETWORK, RES 1.0K	
RB502	1-236-424-11	NETWORK, RES 10K	
RB503	1-236-412-11	NETWORK, RES 1.0K	
RB504	1-236-442-11	NETWORK, RES 330K	
RB505	1-236-424-11	NETWORK, RES 10K	
RB506	1-236-424-11	NETWORK, RES 10K	
RB507	1-236-412-11	NETWORK, RES 1.0K	
RB509	1-236-904-11	RESISTOR, NETWORK (CHIP TYPE) 1K	
RB510	1-236-432-11	NETWORK, RES 47K	
RB512	1-236-424-11	NETWORK, RES 10K	
RB513	1-236-432-11	NETWORK, RES 47K	
RB516	1-236-904-11	RESISTOR, NETWORK (CHIP TYPE) 1K	
RB517	1-236-436-11	NETWORK, RES 100K	
RB518	1-236-907-11	RESISTOR, NETWORK (CHIP TYPE) 100K	
RB519	1-236-908-11	RESISTOR, NETWORK (CHIP TYPE) 10K	
RB520	1-236-412-11	NETWORK, RES 1.0K	
RB522	1-236-424-11	NETWORK, RES 10K	
RB523	1-236-424-11	NETWORK, RES 10K	
RB524	1-236-442-11	NETWORK, RES 330K	
RB525	1-236-432-11	NETWORK, RES 47K	
RB526	1-236-408-11	NETWORK, RES 470	
RB527	1-236-432-11	NETWORK, RES 47K	
RB528	1-236-432-11	NETWORK, RES 47K	
RB529	1-236-424-11	NETWORK, RES 10K	
RB530	1-236-424-11	NETWORK, RES 10K	
RB702	1-236-432-11	NETWORK, RES 47K	
RB705	1-236-416-11	NETWORK, RES 2.2K	
RB708	1-236-416-11	NETWORK, RES 2.2K	
RB709	1-236-416-11	NETWORK, RES 2.2K	
RB710	1-236-412-11	NETWORK, RES 1.0K	
RB711	1-236-412-11	NETWORK, RES 1.0K	
RB712	1-236-412-11	NETWORK, RES 1.0K	
RB713	1-236-412-11	NETWORK, RES 1.0K	
RB714	1-236-412-11	NETWORK, RES 1.0K	

(VIBRATOR)

Ref. No.	Part No.	Description	Remark
X501	1-579-368-31	VIBRATOR, CRYSTAL (11.719MHz)	
X502	1-579-550-11	VIBRATOR, CRYSTAL (32KHz)	
X503	1-578-713-21	VIBLATOR, CERAMIC (4.19MHz)	
X504	1-579-551-11	VIBRATOR, CERAMIC (700KHz)	
X701	1-579-553-11	VIBRATOR (10MHz)	
X801	1-579-076-11	VIBRATOR, CRYSTAL (28.375MHz)	

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* 1-643-031-11 DK-21 BOARD (Ref.No 8,000 Series)

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(SWITCH)

Ref. No.	Part No.	Description	Remark
S561	1-572-938-21	SWITCH, TACTIL (COUNTER RESET)	
S562	1-572-938-21	SWITCH, TACTIL (ZEROMEM)	
S563	1-572-938-21	SWITCH, TACTIL (TAPE/BATT CHECK)	

(FLAT CABLE)

Ref. No.	Part No.	Description	Remark
W564	1-643-081-11	FP-492 FLEXIBLE BOARD	

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* A-7071-585-A FK-54 BOARD, COMPLETE

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(Ref.No 10,000 Series)

(CONNECTOR)

Ref. No.	Part No.	Description	Remark
CN565	1-691-483-21	CONNECTOR, FFC/FPC 4P	

(SWITCH)

Ref. No.	Part No.	Description	Remark
S560	1-692-111-11	SWITCH, KEY BOARD (FADER)	

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* A-7063-128-A MA-128 BOARD, COMPLETE

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(Ref.No 3,000 Series)

(CAPACITOR)

Ref. No.	Part No.	Description	Remark
C801	1-162-964-11	CERAMIC CHIP 0.001uF 10% 50V	
C802	1-163-989-11	CERAMIC CHIP 0.033uF 10% 25V	
C803	1-162-964-11	CERAMIC CHIP 0.001uF 10% 50V	
C804	1-162-953-11	CERAMIC CHIP 100PF 5% 50V	
C805	1-162-953-11	CERAMIC CHIP 100PF 5% 50V	
C806	1-164-227-11	CERAMIC CHIP 0.022uF 10% 25V	
C807	1-164-633-11	CERAMIC CHIP 0.1uF 10% 25V	
C808	1-164-633-11	CERAMIC CHIP 0.1uF 10% 25V	
C809	1-162-953-11	CERAMIC CHIP 100PF 5% 50V	
C810	1-164-677-11	CERAMIC CHIP 0.033uF 10% 16V	
C811	1-164-362-11	CERAMIC CHIP 470PF 5% 50V	
C812	1-164-633-11	CERAMIC CHIP 0.1uF 10% 25V	
C813	1-162-638-11	CERAMIC CHIP 1uF 16V	
C814	1-162-957-11	CERAMIC CHIP 220PF 5% 50V	
C815	1-164-245-11	CERAMIC CHIP 0.015uF 10% 25V	
C816	1-164-227-11	CERAMIC CHIP 0.022uF 10% 25V	
C817	1-164-227-11	CERAMIC CHIP 0.022uF 10% 25V	

Ref. No.	Part No.	Description	Remark
C818	1-162-957-11	CERAMIC CHIP 220PF 5% 50V	
C819	1-162-964-11	CERAMIC CHIP 0.001uF 10% 50V	
C820	1-162-953-11	CERAMIC CHIP 100PF 5% 50V	
C831	1-162-964-11	CERAMIC CHIP 0.001uF 10% 50V	
C832	1-163-989-11	CERAMIC CHIP 0.033uF 10% 25V	
C833	1-162-964-11	CERAMIC CHIP 0.001uF 10% 50V	
C834	1-162-953-11	CERAMIC CHIP 100PF 5% 50V	
C835	1-162-953-11	CERAMIC CHIP 100PF 5% 50V	
C836	1-164-227-11	CERAMIC CHIP 0.022uF 10% 25V	
C837	1-164-633-11	CERAMIC CHIP 0.1uF 10% 25V	
C838	1-164-633-11	CERAMIC CHIP 0.1uF 10% 25V	
C839	1-162-953-11	CERAMIC CHIP 100PF 5% 50V	
C840	1-164-677-11	CERAMIC CHIP 0.033uF 10% 16V	
C841	1-164-362-11	CERAMIC CHIP 470PF 5% 50V	
C842	1-164-633-11	CERAMIC CHIP 0.1uF 10% 25V	
C843	1-162-638-11	CERAMIC CHIP 1uF 16V	
C844	1-162-957-11	CERAMIC CHIP 220PF 5% 50V	
C845	1-164-245-11	CERAMIC CHIP 0.015uF 10% 25V	
C846	1-164-227-11	CERAMIC CHIP 0.022uF 10% 25V	
C847	1-164-227-11	CERAMIC CHIP 0.022uF 10% 25V	
C848	1-162-957-11	CERAMIC CHIP 220PF 5% 50V	
C849	1-162-964-11	CERAMIC CHIP 0.001uF 10% 50V	
C850	1-162-953-11	CERAMIC CHIP 100PF 5% 50V	
C861	1-164-222-11	CERAMIC CHIP 0.22uF 25V	
C862	1-163-809-11	CERAMIC CHIP 0.047uF 10% 25V	
C863	1-163-037-11	CERAMIC CHIP 0.022uF 10% 25V	
C864	1-164-222-11	CERAMIC CHIP 0.22uF 25V	
C865	1-135-149-21	TANTALUM CHIP 2.2uF 20% 10V	
C866	1-162-964-11	CERAMIC CHIP 0.001uF 10% 50V	
C867	1-135-149-21	TANTALUM CHIP 2.2uF 20% 10V	
C868	1-135-149-21	TANTALUM CHIP 2.2uF 20% 10V	
C869	1-163-989-11	CERAMIC CHIP 0.033uF 10% 25V	
C870	1-163-989-11	CERAMIC CHIP 0.033uF 10% 25V	
C871	1-135-166-21	TANTALUM CHIP 47uF 10% 10V	
C872	1-162-964-11	CERAMIC CHIP 0.001uF 10% 50V	
C891	1-135-259-11	TANTAL. CHIP 10uF 20% 6.3V	
		(CONNECTOR)	
CN801	1-580-057-11	PIN, CONNECTOR 4P	
CN831	1-580-057-11	PIN, CONNECTOR 4P	
		(DIODE)	
D861	8-719-404-46	DIODE MA110	
D862	8-719-420-14	DIODE MA8082-M	
D863	8-719-420-14	DIODE MA8082-M	
		(IC)	
IC801	8-759-823-41	IC LA7470M	
IC861	8-759-710-79	IC NJM2107F	
IC891	8-749-923-29	IC RS-20E-T	

Ref. No.	Part No.	Description	Remark
		(JACK)	
J801	1-691-737-11	JACK, SMALL (MIC, PLUG IN POWER)	
		(COIL)	
L801	1-412-979-21	INDUCTOR 1uH	
L803	1-412-979-21	INDUCTOR 1uH	
L831	1-412-979-21	INDUCTOR 1uH	
		(TRANSISTOR)	
Q801	8-729-822-97	TRANSISTOR 2SC4211-5.6.7	
Q802	8-729-823-00	TRANSISTOR 2SA1622-5.6.7	
Q803	8-729-822-48	TRANSISTOR FC101	
Q831	8-729-822-97	TRANSISTOR 2SC4211-5.6.7	
Q832	8-729-823-00	TRANSISTOR 2SA1622-5.6.7	
Q833	8-729-822-48	TRANSISTOR FC101	
Q861	8-729-822-94	TRANSISTOR FC102	
Q862	8-729-822-97	TRANSISTOR 2SC4211-5.6.7	
Q863	8-729-010-80	TRANSISTOR FC13	
		(RESISTOR)	
R801	1-216-825-11	METAL CHIP 2.2K 5% 1/16W	
R802	1-216-845-11	METAL CHIP 100K 5% 1/16W	
R803	1-216-845-11	METAL CHIP 100K 5% 1/16W	
R804	1-216-833-11	METAL CHIP 10K 5% 1/16W	
R805	1-216-831-11	METAL CHIP 6.8K 5% 1/16W	
R806	1-216-837-11	METAL CHIP 22K 5% 1/16W	
R807	1-216-850-11	METAL CHIP 270K 5% 1/16W	
R808	1-216-845-11	METAL CHIP 100K 5% 1/16W	
R809	1-216-833-11	METAL CHIP 10K 5% 1/16W	
R810	1-216-830-11	METAL CHIP 5.6K 5% 1/16W	
R811	1-216-832-11	METAL CHIP 8.2K 5% 1/16W	
R812	1-216-839-11	METAL CHIP 33K 5% 1/16W	
R813	1-216-864-11	METAL CHIP 0 5% 1/16W	
R814	1-216-864-11	METAL CHIP 0 5% 1/16W	
R815	1-216-820-11	METAL CHIP 820 5% 1/16W	
R816	1-216-831-11	METAL CHIP 6.8K 5% 1/16W	
R817	1-216-821-11	METAL CHIP 1K 5% 1/16W	
R818	1-216-839-11	METAL CHIP 33K 5% 1/16W	
R819	1-216-839-11	METAL CHIP 33K 5% 1/16W	
R820	1-216-834-11	METAL CHIP 12K 5% 1/16W	
R831	1-216-825-11	METAL CHIP 2.2K 5% 1/16W	
R832	1-216-845-11	METAL CHIP 100K 5% 1/16W	
R833	1-216-845-11	METAL CHIP 100K 5% 1/16W	
R834	1-216-833-11	METAL CHIP 10K 5% 1/16W	
R835	1-216-831-11	METAL CHIP 6.8K 5% 1/16W	
R836	1-216-837-11	METAL CHIP 22K 5% 1/16W	
R837	1-216-845-11	METAL CHIP 100K 5% 1/16W	
R838	1-216-850-11	METAL CHIP 270K 5% 1/16W	
R839	1-216-833-11	METAL CHIP 10K 5% 1/16W	
R840	1-216-830-11	METAL CHIP 5.6K 5% 1/16W	

Ref. No.	Part No.	Description				Remark
R841	1-216-832-11	METAL CHIP	8.2K	5%	1/16W	
R842	1-216-839-11	METAL CHIP	33K	5%	1/16W	
R843	1-216-864-11	METAL CHIP	0	5%	1/16W	
R844	1-216-864-11	METAL CHIP	0	5%	1/16W	
R845	1-216-820-11	METAL CHIP	820	5%	1/16W	
R846	1-216-831-11	METAL CHIP	6.8K	5%	1/16W	
R847	1-216-821-11	METAL CHIP	1K	5%	1/16W	
R848	1-216-839-11	METAL CHIP	33K	5%	1/16W	
R849	1-216-839-11	METAL CHIP	33K	5%	1/16W	
R850	1-216-834-11	METAL CHIP	12K	5%	1/16W	
R861	1-216-833-11	METAL CHIP	10K	5%	1/16W	
R862	1-216-848-11	METAL CHIP	180K	5%	1/16W	
R863	1-216-845-11	METAL CHIP	100K	5%	1/16W	
R864	1-216-841-11	METAL CHIP	47K	5%	1/16W	
R865	1-216-839-11	METAL CHIP	33K	5%	1/16W	
R866	1-216-841-11	METAL CHIP	47K	5%	1/16W	
R867	1-216-841-11	METAL CHIP	47K	5%	1/16W	
R868	1-216-845-11	METAL CHIP	100K	5%	1/16W	
R869	1-216-830-11	METAL CHIP	5.6K	5%	1/16W	
R870	1-216-857-11	METAL CHIP	1M	5%	1/16W	
R871	1-216-833-11	METAL CHIP	10K	5%	1/16W	
R872	1-216-841-11	METAL CHIP	47K	5%	1/16W	
R873	1-216-853-11	METAL CHIP	470K	5%	1/16W	
R874	1-216-857-11	METAL CHIP	1M	5%	1/16W	
R875	1-216-857-11	METAL CHIP	1M	5%	1/16W	
R891	1-216-296-00	METAL CHIP	0	5%	1/8W	
R893	1-216-833-11	METAL CHIP	10K	5%	1/16W	

(FLAT CABLE)

Ref. No.	Part No.	Description	Remark
W861	1-690-773-11	CABLE, FLAT (FFC-53) 9P	

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* A-7071-580-A PJ-47 BOARD, COMPLETE (AEP, UK)

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* A-7071-703-A PJ-47 BOARD, COMPLETE (E, AUS)

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(Ref. No 5,000 Series)

(BUZZER)

Ref. No.	Part No.	Description	Remark
BZ550	1-529-107-11	BUZZER, PIEZOELECTRIC	

(CAPACITOR)

Ref. No.	Part No.	Description				Remark
C550	1-162-964-11	CERAMIC CHIP	0.001uF	10%	50V	
C551	1-162-964-11	CERAMIC CHIP	0.001uF	10%	50V	

(DIODE)

Ref. No.	Part No.	Description		Remark
D550	8-719-820-05	DIODE	1SS181	
D551	8-719-420-14	DIODE	MA8082-M	
D552	8-719-420-14	DIODE	MA8082-M	
D553	8-719-420-14	DIODE	MA8082-M	
D554	8-719-420-14	DIODE	MA8082-M	

(RESISTOR)

Ref. No.	Part No.	Description				Remark
R551	1-216-845-11	METAL CHIP	100K	5%	1/16W	
R552	1-216-295-00	METAL CHIP	0	5%	1/10W	
R553	1-216-150-00	METAL GLAZE	10	5%	1/8W	
R554	1-216-864-11	METAL CHIP	0	5%	1/16W	(AEP, UK)
R555	1-216-864-11	METAL CHIP	0	5%	1/16W	

(SWITCH)

Ref. No.	Part No.	Description	Remark
S550	1-571-275-31	SWITCH, SLIDE (EDIT)	
S551	1-571-674-11	SWITCH, SLIDE (V/A IN/OUT) (E, AUS)	
S552	1-572-283-11	SWITCH, SLIDE (HiFi SOUND)	

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* A-7071-584-A PK-32 BOARD, COMPLETE

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(Ref. NO 9,000 Series)

(CONNECTOR)

Ref. No.	Part No.	Description	Remark
CN540	1-691-485-21	CONNECTOR, FFC/FPC 6P	

(DIODE)

Ref. No.	Part No.	Description		Remark
D540	8-719-820-05	DIODE	1SS181	

(SWITCH)

Ref. No.	Part No.	Description	Remark
S540	1-572-283-11	SWITCH, SLIDE (POWER CAM/VTR)	
S541	1-571-275-31	SWITCH, SLIDE (BEEP)	
S542	1-571-275-31	SWITCH, SLIDE (REMOCON)	

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* A-7063-125-A PS-300 BOARD, COMPLETE

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(Ref. No 3,000 Series)

(CAPACITOR)

Ref. No.	Part No.	Description				Remark
C948	1-164-337-11	CERAMIC CHIP	2.2uF		16V	
C949	1-164-337-11	CERAMIC CHIP	2.2uF		16V	
C950	1-164-633-11	CERAMIC CHIP	0.1uF	10%	25V	
C951	1-164-384-11	CERAMIC CHIP	130PF	5%	50V	
C952	1-162-965-11	CERAMIC CHIP	0.0015uF	10%	50V	
C953	1-162-965-11	CERAMIC CHIP	0.0015uF	10%	50V	
C954	1-164-633-11	CERAMIC CHIP	0.1uF	10%	25V	
C957	1-164-227-11	CERAMIC CHIP	0.022uF	10%	25V	
C958	1-162-965-11	CERAMIC CHIP	0.0015uF	10%	50V	
C959	1-164-227-11	CERAMIC CHIP	0.022uF	10%	25V	
C960	1-164-730-11	CERAMIC CHIP	0.0012uF	5%	50V	
C961	1-164-633-11	CERAMIC CHIP	0.1uF	10%	25V	
C962	1-164-633-11	CERAMIC CHIP	0.1uF	10%	25V	
C963	1-162-964-11	CERAMIC CHIP	0.001uF	10%	50V	
C965	1-162-964-11	CERAMIC CHIP	0.001uF	10%	50V	
C966	1-162-964-11	CERAMIC CHIP	0.001uF	10%	50V	

Ref. No.	Part No.	Description	Remark
C968	1-162-964-11	CERAMIC CHIP 0.001uF 10% 50V	
C969	1-162-964-11	CERAMIC CHIP 0.001uF 10% 50V	
C970	1-162-963-11	CERAMIC CHIP 680PF 10% 50V	
C971	1-162-928-11	CERAMIC CHIP 120PF 5% 50V	
C972	1-162-928-11	CERAMIC CHIP 120PF 5% 50V	
C973	1-128-530-11	ELECT CHIP 33uF 20% 10V	
C974	1-128-004-11	ELECT CHIP 10uF 20% 16V	
C975	1-127-558-11	ELECT(SOLID) 10uF 20% 10V	
C976	1-128-004-11	ELECT CHIP 10uF 20% 16V	
C977	1-135-165-11	TANTAL. CHIP 33uF 20% 16V	
C978	1-164-830-11	CERAMIC CHIP 1uF 22% 16V	
C979	1-164-337-11	CERAMIC CHIP 2.2uF 16V	
C980	1-164-337-11	CERAMIC CHIP 2.2uF 16V	
C981	1-164-830-11	CERAMIC CHIP 1uF 22% 16V	
C982	1-127-558-11	ELECT(SOLID) 10uF 20% 10V	
C983	1-164-337-11	CERAMIC CHIP 2.2uF 16V	
C984	1-164-337-11	CERAMIC CHIP 2.2uF 16V	
C985	1-128-004-11	ELECT CHIP 10uF 20% 16V	
C986	1-127-558-11	ELECT(SOLID) 10uF 20% 10V	
C987	1-128-004-11	ELECT CHIP 10uF 20% 16V	
C988	1-128-530-11	ELECT CHIP 33uF 20% 10V	
C989	1-127-559-11	ELECT(SOLID) 15uF 20% 6.3V	
C990	1-164-346-11	CERAMIC CHIP 1uF 16V	
C991	1-164-346-11	CERAMIC CHIP 1uF 16V	
C992	1-128-004-11	ELECT CHIP 10uF 20% 16V	
C993	1-126-205-11	ELECT CHIP 47uF 20% 6.3V	
C994	1-162-970-11	CERAMIC CHIP 0.01uF 10% 25V	
C995	1-128-530-11	ELECT CHIP 33uF 20% 10V	
C996	1-128-004-11	ELECT CHIP 10uF 20% 16V	
C997	1-162-962-11	CERAMIC CHIP 470PF 10% 50V	
C998	1-128-530-11	ELECT CHIP 33uF 20% 10V	

(CONNECTOR)

Ref. No.	Part No.	Description	Remark
CN950	1-691-542-21	CONNECTOR, BOARD TO BOARD 48P	

(DIODE)

Ref. No.	Part No.	Description	Remark
D950	8-719-989-33	DIODE FC806	
D953	8-719-110-03	DIODE RD7.5ES-B2	
D961	8-719-404-46	DIODE MA110	
D962	8-719-110-03	DIODE RD7.5ES-B2	
D963	8-719-110-03	DIODE RD7.5ES-B2	
D964	8-719-404-46	DIODE MA110	

(IC)

Ref. No.	Part No.	Description	Remark
⚠IC950	8-759-060-94	IC MB3785APFV-G-BND-ER	

(JACK)

Ref. No.	Part No.	Description	Remark
J950	1-537-281-31	TERMINAL BOARD (EASY CONNECTION)	
J951	1-565-276-21	JACK, ULTRA SMALL 1P (REMOTE)	
J952	1-569-809-11	JACK (SMALL TYPE)(HEADPHONE)	

(COIL)

Ref. No.	Part No.	Description	Remark
L950	1-424-519-21	COIL, MOLD CHOKE 1.0uH	
L951	1-424-519-21	COIL, MOLD CHOKE 1.0uH	
L952	1-424-519-21	COIL, MOLD CHOKE 1.0uH	
L953	1-424-519-21	COIL, MOLD CHOKE 1.0uH	
L954	1-424-522-21	COIL, CHOKE 10uH	
L955	1-424-522-21	COIL, CHOKE 10uH	
L956	1-424-522-21	COIL, CHOKE 10uH	
L957	1-424-524-21	COIL, CHOKE 47uH	
L958	1-412-034-11	INDUCTOR CHIP 330uH	
L959	1-412-034-11	INDUCTOR CHIP 330uH	
L960	1-412-027-11	INDUCTOR CHIP 2.2uH	
L961	1-412-029-11	INDUCTOR CHIP 10uH	
L962	1-412-029-11	INDUCTOR CHIP 10uH	
L963	1-412-028-11	INDUCTOR CHIP 4.7uH	
L964	1-424-524-21	COIL, CHOKE 47uH	
L965	1-424-524-21	COIL, CHOKE 47uH	
L966	1-410-369-11	INDUCTOR CHIP 1uH	
L967	1-410-369-11	INDUCTOR CHIP 1uH	
L968	1-412-979-21	INDUCTOR 1uH	
L972	1-412-979-21	INDUCTOR 1uH	
L973	1-412-026-11	INDUCTOR CHIP 1uH	
L974	1-412-979-21	INDUCTOR 1uH	
L975	1-412-979-21	INDUCTOR 1uH	
L976	1-412-026-11	INDUCTOR CHIP 1uH	

(IC LINK)

Ref. No.	Part No.	Description	Remark
⚠PS950	1-532-841-21	LINK, IC (SOC1600 1.6A)	
⚠PS951	1-532-841-21	LINK, IC (SOC1600 1.6A)	

(TRANSISTOR)

Ref. No.	Part No.	Description	Remark
Q950	8-729-823-95	TRANSISTOR FC149	
Q951	8-729-804-41	TRANSISTOR 2SB1122-S	
Q952	8-729-823-84	TRANSISTOR FP102	
Q953	8-729-823-82	TRANSISTOR FP101	
Q954	8-729-823-82	TRANSISTOR FP101	
Q955	8-729-905-12	TRANSISTOR DTA144EU	
Q957	8-729-011-26	TRANSISTOR 2SJ179	
Q958	8-729-420-12	TRANSISTOR XN4213	
Q959	8-729-011-26	TRANSISTOR 2SJ179	
Q960	8-729-402-81	TRANSISTOR XN4501	

(RESISTOR)

Ref. No.	Part No.	Description	Remark
R950	1-216-837-11	METAL CHIP 22K 5% 1/16W	
R951	1-216-679-11	METAL CHIP 15K 0.5% 1/10W	
R952	1-216-842-11	METAL CHIP 56K 5% 1/16W	
R953	1-216-837-11	METAL CHIP 22K 5% 1/16W	
R954	1-216-831-11	METAL CHIP 6.8K 5% 1/16W	

The components identified by mark ⚠ or dotted line with mark ⚠ are critical for safety.
Replace only with part number specified.

Ref. No.	Part No.	Description				Remark
R955	1-216-827-11	METAL CHIP	3.3K	5%	1/16W	
R956	1-218-347-11	METAL GLAZE	91K	5%	1/16W	
R957	1-218-332-11	METAL GLAZE	130K	5%	1/16W	
R958	1-216-823-11	METAL CHIP	1.5K	5%	1/16W	
R959	1-216-679-11	METAL CHIP	15K	0.5%	1/10W	
R960	1-216-696-11	METAL CHIP	75K	0.5%	1/10W	
R961	1-216-834-11	METAL CHIP	12K	5%	1/16W	
R962	1-216-829-11	METAL CHIP	4.7K	5%	1/16W	
R964	1-216-679-11	METAL CHIP	15K	0.5%	1/10W	
R965	1-216-833-11	METAL CHIP	10K	5%	1/16W	
R966	1-216-665-11	METAL CHIP	3.9K	0.5%	1/10W	
R967	1-216-841-11	METAL CHIP	47K	5%	1/16W	
R968	1-216-832-11	METAL CHIP	8.2K	5%	1/16W	
R969	1-216-823-11	METAL CHIP	1.5K	5%	1/16W	
R970	1-216-830-11	METAL CHIP	5.6K	5%	1/16W	
R971	1-216-676-11	METAL CHIP	11K	0.5%	1/10W	
R972	1-216-845-11	METAL CHIP	100K	5%	1/16W	
R973	1-216-829-11	METAL CHIP	4.7K	5%	1/16W	
R974	1-216-829-11	METAL CHIP	4.7K	5%	1/16W	
R975	1-216-176-00	METAL GLAZE	120	5%	1/8W	
R976	1-216-182-00	METAL GLAZE	220	5%	1/8W	
R977	1-216-182-00	METAL GLAZE	220	5%	1/8W	
R978	1-216-182-00	METAL GLAZE	220	5%	1/8W	
R979	1-216-295-00	METAL CHIP	0	5%	1/10W	
R980	1-216-827-11	METAL CHIP	3.3K	5%	1/16W	
R981	1-216-841-11	METAL CHIP	47K	5%	1/16W	
R982	1-216-845-11	METAL CHIP	100K	5%	1/16W	
R983	1-216-821-11	METAL CHIP	1K	5%	1/16W	
R984	1-216-681-11	METAL CHIP	18K	0.5%	1/10W	
R985	1-216-687-11	METAL CHIP	33K	0.5%	1/10W	
R986	1-216-845-11	METAL CHIP	100K	5%	1/16W	
R987	1-216-833-11	METAL CHIP	10K	5%	1/16W	
R988	1-216-825-11	METAL CHIP	2.2K	5%	1/16W	
R989	1-216-821-11	METAL CHIP	1K	5%	1/16W	
R990	1-216-296-00	METAL CHIP	0	5%	1/8W	
R991	1-216-864-11	METAL CHIP	0	5%	1/16W	

(TRANSFORMER)

T950	1-450-874-21	TRANSFORMER, DC-DC CONVERTER

(VIBRATOR)

X950	1-579-467-11	VIBRATOR, CERAMIC (475KHz)

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* A-7063-127-A SL-25 BOARD, COMPLETE

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(Ref. No 3,000 Series)

(CAPACITOR)

C500	1-128-004-11	ELECT CHIP	10uF	20%	16V
C503	1-128-013-11	ELECT CHIP	1uF	20%	50V
C504	1-128-004-11	ELECT CHIP	10uF	20%	16V
C505	1-163-809-11	CERAMIC CHIP	0.047uF	10%	25V
C506	1-162-968-11	CERAMIC CHIP	0.0047uF	10%	50V
C507	1-164-156-11	CERAMIC CHIP	0.1uF		25V
C508	1-164-156-11	CERAMIC CHIP	0.1uF		25V
C509	1-164-156-11	CERAMIC CHIP	0.1uF		25V

(CONNECTOR)

CN501	1-691-473-21	CONNECTOR, FFC/FPC 7P
CN502	1-691-472-21	CONNECTOR, FFC/FPC 6P
CN503	1-691-482-21	CONNECTOR, FFC/FPC 15P

(DIODE)

D511	8-719-404-46	DIODE	MA110

(IC)

IC501	8-759-059-09	IC	LB8111V

(COIL)

L501	1-412-026-11	INDUCTOR CHIP	1uH

(TRANSISTOR)

Q501	8-729-402-81	TRANSISTOR	XN4501

(RESISTOR)

R502	1-216-864-11	METAL CHIP	0	5%	1/16W
R504	1-216-840-11	METAL CHIP	39K	5%	1/16W
R506	1-216-845-11	METAL CHIP	100K	5%	1/16W
R512	1-216-845-11	METAL CHIP	100K	5%	1/16W
R514	1-216-845-11	METAL CHIP	100K	5%	1/16W
R517	1-216-174-00	METAL GLAZE	100	5%	1/8W

(CONPOSITION CIRCUIT BLOCK)

RB500	1-236-424-11	NETWORK, RES 10K
RB502	1-236-424-11	NETWORK, RES 10K

(FLAT CABLE)

W500	1-644-461-21	FP-600 FLEXIBLE BOARD
W501	1-642-186-11	FP-437 FLEXIBLE BOARD

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* A-7071-581-A SW-201 BOARD, COMPLETE

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(Ref. No 6,000 Series)

(CONNECTOR)

CN580	1-691-483-21	CONNECTOR, FFC/FPC 4P

Ref. No.	Part No.	Description	Remark
		(SWITCH)	
S580	1-692-111-11	SWITCH, KEY BOARD (START/STOP)	
S581	1-571-275-31	SWITCH, SLIDE (STANDBY)	
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*	A-7063-126-A	VA-74 BOARD, COMPLETE (AEP,UK) **********************	
	A-7063-332-A	VA-74 BOARD, COMPLETE (E,AUS) ********************** (Ref.No 2,000 Series)	
*	3-946-181-01	CASE (MAIN), SHIELD, VA	
*	3-946-182-01	CASE (LID), SHIELD, VA	
		(CAPACITOR)	
C052	1-162-638-11	CERAMIC CHIP 1uF 16V	
C053	1-135-180-21	TANTALUM CHIP 3.3uF 20% 6.3V	
C054	1-162-974-11	CERAMIC CHIP 0.01uF 50V	
C055	1-162-974-11	CERAMIC CHIP 0.01uF 50V	
C056	1-135-180-21	TANTALUM CHIP 3.3uF 20% 6.3V	
C057	1-162-974-11	CERAMIC CHIP 0.01uF 50V	
C058	1-135-180-21	TANTALUM CHIP 3.3uF 20% 6.3V	
C059	1-164-156-11	CERAMIC CHIP 0.1uF 25V	
C060	1-135-259-11	TANTAL. CHIP 10uF 20% 6.3V	
C061	1-162-974-11	CERAMIC CHIP 0.01uF 50V	
C062	1-162-974-11	CERAMIC CHIP 0.01uF 50V	
C063	1-135-259-11	TANTAL. CHIP 10uF 20% 6.3V	
C064	1-162-950-11	CERAMIC CHIP 56PF 5% 50V	
C065	1-162-947-11	CERAMIC CHIP 33PF 5% 50V	
C066	1-162-951-11	CERAMIC CHIP 68PF 5% 50V	
C070	1-162-947-11	CERAMIC CHIP 33PF 5% 50V	
C071	1-128-003-11	ELECT CHIP 22uF 20% 4V	
C072	1-162-974-11	CERAMIC CHIP 0.01uF 50V	
C073	1-162-974-11	CERAMIC CHIP 0.01uF 50V	
C074	1-128-004-11	ELECT CHIP 10uF 20% 16V	
C075	1-162-974-11	CERAMIC CHIP 0.01uF 50V	
C077	1-128-004-11	ELECT CHIP 10uF 20% 16V	
C078	1-162-942-11	CERAMIC CHIP 12PF 5% 50V	
C090	1-162-974-11	CERAMIC CHIP 0.01uF 50V	
C091	1-128-004-11	ELECT CHIP 10uF 20% 16V	
C092	1-162-974-11	CERAMIC CHIP 0.01uF 50V	
C093	1-164-506-11	CERAMIC CHIP 4.7uF 16V	
C095	1-162-974-11	CERAMIC CHIP 0.01uF 50V	
C096	1-162-974-11	CERAMIC CHIP 0.01uF 50V	
C099	1-164-156-11	CERAMIC CHIP 0.1uF 25V	
C101	1-128-004-11	ELECT CHIP 10uF 20% 16V	
C102	1-162-974-11	CERAMIC CHIP 0.01uF 50V	
C103	1-162-974-11	CERAMIC CHIP 0.01uF 50V	
C104	1-164-145-11	CERAMIC CHIP 390PF 5% 50V	
C105	1-162-974-11	CERAMIC CHIP 0.01uF 50V	
C106	1-162-947-11	CERAMIC CHIP 33PF 5% 50V	

Ref. No.	Part No.	Description	Remark
C107	1-162-965-11	CERAMIC CHIP 0.0015uF 10% 50V	
C108	1-162-958-11	CERAMIC CHIP 270PF 5% 50V	
C109	1-162-944-11	CERAMIC CHIP 18PF 5% 50V	
C110	1-162-937-11	CERAMIC CHIP 6PF 0.5PF 50V	
C112	1-164-227-11	CERAMIC CHIP 0.022uF 10% 25V	
C113	1-164-227-11	CERAMIC CHIP 0.022uF 10% 25V	
C114	1-162-942-11	CERAMIC CHIP 12PF 5% 50V	
C115	1-162-970-11	CERAMIC CHIP 0.01uF 10% 25V	
C116	1-162-970-11	CERAMIC CHIP 0.01uF 10% 25V	
C117	1-164-227-11	CERAMIC CHIP 0.022uF 10% 25V	
C119	1-162-947-11	CERAMIC CHIP 33PF 5% 50V	
C120	1-162-974-11	CERAMIC CHIP 0.01uF 50V	
C121	1-164-227-11	CERAMIC CHIP 0.022uF 10% 25V	
C123	1-162-922-11	CERAMIC CHIP 39PF 5% 50V	
C124	1-164-218-11	CERAMIC CHIP 180PF 0.25PF 50V	
C125	1-162-926-11	CERAMIC CHIP 82PF 5% 50V	
C126	1-162-923-11	CERAMIC CHIP 47PF 5% 50V	
C128	1-164-156-11	CERAMIC CHIP 0.1uF 25V	
C201	1-162-959-11	CERAMIC CHIP 330PF 5% 50V	
C202	1-162-954-11	CERAMIC CHIP 120PF 5% 50V	
C203	1-164-005-11	CERAMIC CHIP 0.47uF 25V	
C204	1-128-004-11	ELECT CHIP 10uF 20% 16V	
C205	1-128-004-11	ELECT CHIP 10uF 20% 16V	
C206	1-162-974-11	CERAMIC CHIP 0.01uF 50V	
C207	1-162-974-11	CERAMIC CHIP 0.01uF 50V	
C208	1-128-004-11	ELECT CHIP 10uF 20% 16V	
C209	1-128-008-11	ELECT CHIP 3.3uF 20% 35V	
C210	1-162-974-11	CERAMIC CHIP 0.01uF 50V	
C211	1-128-004-11	ELECT CHIP 10uF 20% 16V	
C212	1-128-008-11	ELECT CHIP 3.3uF 20% 35V	
C213	1-128-004-11	ELECT CHIP 10uF 20% 16V	
C214	1-128-004-11	ELECT CHIP 10uF 20% 16V	
C215	1-128-004-11	ELECT CHIP 10uF 20% 16V	
C217	1-164-005-11	CERAMIC CHIP 0.47uF 25V	
C218	1-128-004-11	ELECT CHIP 10uF 20% 16V	
C219	1-164-005-11	CERAMIC CHIP 0.47uF 25V	
C221	1-128-004-11	ELECT CHIP 10uF 20% 16V	
C222	1-162-974-11	CERAMIC CHIP 0.01uF 50V	
C223	1-128-004-11	ELECT CHIP 10uF 20% 16V	
C224	1-164-222-11	CERAMIC CHIP 0.22uF 25V	
C225	1-164-005-11	CERAMIC CHIP 0.47uF 25V	
C226	1-128-004-11	ELECT CHIP 10uF 20% 16V	
C227	1-128-004-11	ELECT CHIP 10uF 20% 16V	
C228	1-128-006-11	ELECT CHIP 4.7uF 20% 25V	
C229	1-162-974-11	CERAMIC CHIP 0.01uF 50V	
C230	1-126-246-11	ELECT CHIP 220uF 20% 4V	
C231	1-128-004-11	ELECT CHIP 10uF 20% 16V	
C232	1-164-245-11	CERAMIC CHIP 0.015uF 10% 25V	
C234	1-162-974-11	CERAMIC CHIP 0.01uF 50V	
C235	1-128-004-11	ELECT CHIP 10uF 20% 16V	

Ref. No.	Part No.	Description				Remark
C237	1-164-361-11	CERAMIC CHIP	0.047uF		16V	
C238	1-126-607-11	ELECT CHIP	47uF	20%	4V	
C239	1-162-960-11	CERAMIC CHIP	220PF	10%	50V	
C240	1-128-004-11	ELECT CHIP	10uF	20%	16V	
C241	1-162-974-11	CERAMIC CHIP	0.01uF		50V	
C242	1-128-004-11	ELECT CHIP	10uF	20%	16V	
C243	1-162-974-11	CERAMIC CHIP	0.01uF		50V	
C244	1-128-004-11	ELECT CHIP	10uF	20%	16V	
C245	1-162-974-11	CERAMIC CHIP	0.01uF		50V	
C246	1-162-959-11	CERAMIC CHIP	330PF	5%	50V	
C247	1-164-392-11	CERAMIC CHIP	390PF	5%	50V	
C250	1-162-974-11	CERAMIC CHIP	0.01uF		50V	
C251	1-128-004-11	ELECT CHIP	10uF	20%	16V	
C252	1-162-942-11	CERAMIC CHIP	12PF	5%	50V	
C253	1-162-957-11	CERAMIC CHIP	220PF	5%	50V	
C254	1-164-363-11	CERAMIC CHIP	560PF	5%	50V	
C255	1-162-958-11	CERAMIC CHIP	270PF	5%	50V	
C257	1-126-207-11	ELECT CHIP	33uF	20%	4V	
C258	1-162-974-11	CERAMIC CHIP	0.01uF		50V	
C259	1-162-974-11	CERAMIC CHIP	0.01uF		50V	
C260	1-128-004-11	ELECT CHIP	10uF	20%	16V	
C261	1-162-952-11	CERAMIC CHIP	82PF	5%	50V	
C271	1-162-920-11	CERAMIC CHIP	27PF	5%	50V	
C272	1-162-941-11	CERAMIC CHIP	10PF	0.5PF	50V	
C273	1-126-607-11	ELECT CHIP	47uF	20%	4V	
C274	1-162-947-11	CERAMIC CHIP	33PF	5%	50V	
C275	1-162-955-11	CERAMIC CHIP	150PF	5%	50V	
C276	1-162-950-11	CERAMIC CHIP	56PF	5%	50V	
C277	1-128-004-11	ELECT CHIP	10uF	20%	16V	
C279	1-162-951-11	CERAMIC CHIP	68PF	5%	50V	
C280	1-128-004-11	ELECT CHIP	10uF	20%	16V	
C282	1-162-957-11	CERAMIC CHIP	220PF	5%	50V	
C291	1-162-974-11	CERAMIC CHIP	0.01uF		50V	
C295	1-128-004-11	ELECT CHIP	10uF	20%	16V	
C296	1-162-974-11	CERAMIC CHIP	0.01uF		50V	
C303	1-128-004-11	ELECT CHIP	10uF	20%	16V	
C304	1-162-974-11	CERAMIC CHIP	0.01uF		50V	
C305	1-126-205-11	ELECT CHIP	47uF	20%	6.3V	
C308	1-162-969-11	CERAMIC CHIP	0.0068uF	10%	25V	
C309	1-128-013-11	ELECT CHIP	1uF	20%	50V	
C310	1-128-013-11	ELECT CHIP	1uF	20%	50V	
C311	1-135-176-21	TANTALUM CHIP	0.68uF	10%	20V	
C312	1-164-227-11	CERAMIC CHIP	0.022uF	10%	25V	
C313	1-163-035-00	CERAMIC CHIP	0.047uF		50V	
C314	1-135-259-11	TANTAL. CHIP	10uF	20%	6.3V	
C315	1-162-945-11	CERAMIC CHIP	22PF	5%	50V	
C316	1-162-941-11	CERAMIC CHIP	10PF	0.5PF	50V	
C318	1-162-974-11	CERAMIC CHIP	0.01uF		50V	
C319	1-162-937-11	CERAMIC CHIP	6PF	0.5PF	50V	
C320	1-162-949-11	CERAMIC CHIP	47PF	5%	50V	

Ref. No.	Part No.	Description				Remark
C321	1-162-974-11	CERAMIC CHIP	0.01uF		50V	
C322	1-162-974-11	CERAMIC CHIP	0.01uF		50V	
C323	1-162-944-11	CERAMIC CHIP	18PF	5%	50V	
C324	1-162-974-11	CERAMIC CHIP	0.01uF		50V	
C325	1-162-954-11	CERAMIC CHIP	120PF	5%	50V	
C326	1-162-951-11	CERAMIC CHIP	68PF	5%	50V	
C327	1-162-950-11	CERAMIC CHIP	56PF	5%	50V	
C328	1-162-957-11	CERAMIC CHIP	220PF	5%	50V	
C329	1-162-974-11	CERAMIC CHIP	0.01uF		50V	
C330	1-162-949-11	CERAMIC CHIP	47PF	5%	50V	
C331	1-164-156-11	CERAMIC CHIP	0.1uF		25V	
C332	1-162-952-11	CERAMIC CHIP	82PF	5%	50V	
C333	1-162-968-11	CERAMIC CHIP	0.0047uF	10%	50V	
C334	1-162-953-11	CERAMIC CHIP	100PF	5%	50V	
C335	1-162-974-11	CERAMIC CHIP	0.01uF		50V	
C336	1-164-217-11	CERAMIC CHIP	150PF	5%	50V	
C338	1-162-974-11	CERAMIC CHIP	0.01uF		50V	
C339	1-164-156-11	CERAMIC CHIP	0.1uF		25V	
C361	1-162-936-11	CERAMIC CHIP	5PF	0.25PF	50V	
C362	1-164-156-11	CERAMIC CHIP	0.1uF		25V	
C363	1-162-947-11	CERAMIC CHIP	33PF	5%	50V	
C364	1-162-970-11	CERAMIC CHIP	0.01uF	10%	25V	
C365	1-162-974-11	CERAMIC CHIP	0.01uF		50V	
C366	1-162-638-11	CERAMIC CHIP	1uF		16V	
C367	1-162-974-11	CERAMIC CHIP	0.01uF		50V	
C368	1-164-383-11	CERAMIC CHIP	110PF	5%	50V	
C369	1-162-964-11	CERAMIC CHIP	0.001uF	10%	50V	
C370	1-135-149-21	TANTALUM CHIP	2.2uF	20%	10V	
C371	1-162-964-11	CERAMIC CHIP	0.001uF	10%	50V	
C372	1-164-145-11	CERAMIC CHIP	390PF	5%	50V	
C373	1-162-970-11	CERAMIC CHIP	0.01uF	10%	25V	
C374	1-162-974-11	CERAMIC CHIP	0.01uF		50V	
C376	1-162-638-11	CERAMIC CHIP	1uF		16V	
C377	1-162-964-11	CERAMIC CHIP	0.001uF	10%	50V	
C378	1-135-181-21	TANTALUM CHIP	4.7uF	20%	6.3V	
C379	1-162-974-11	CERAMIC CHIP	0.01uF		50V	
C400	1-126-207-11	ELECT CHIP	33uF	20%	4V	
C401	1-124-778-00	ELECT CHIP	22uF	20%	6.3V	
C402	1-162-957-11	CERAMIC CHIP	220PF	5%	50V	
C403	1-162-957-11	CERAMIC CHIP	220PF	5%	50V	
C404	1-126-205-11	ELECT CHIP	47uF	20%	6.3V	
C405	1-164-633-11	CERAMIC CHIP	0.1uF	10%	25V	
C406	1-164-633-11	CERAMIC CHIP	0.1uF	10%	25V	
C407	1-162-974-11	CERAMIC CHIP	0.01uF		50V	
C408	1-164-156-11	CERAMIC CHIP	0.1uF		25V	
C409	1-164-677-11	CERAMIC CHIP	0.033uF	10%	16V	
C410	1-162-974-11	CERAMIC CHIP	0.01uF		50V	
C412	1-162-957-11	CERAMIC CHIP	220PF	5%	50V	
C413	1-164-156-11	CERAMIC CHIP	0.1uF		25V	
C414	1-164-677-11	CERAMIC CHIP	0.033uF	10%	16V	

Ref. No.	Part No.	Description	Remark
C415	1-162-974-11	CERAMIC CHIP 0.01uF 50V	
C416	1-162-974-11	CERAMIC CHIP 0.01uF 50V	
C417	1-162-957-11	CERAMIC CHIP 220PF 5% 50V	
C418	1-162-974-11	CERAMIC CHIP 0.01uF 50V	
C419	1-162-974-11	CERAMIC CHIP 0.01uF 50V	
C420	1-163-809-11	CERAMIC CHIP 0.047uF 10% 25V	
C421	1-135-163-21	TANTAL. CHIP 47uF 20% 4V	
C422	1-135-157-21	TANTALUM CHIP 10uF 20% 6.3V	
C423	1-162-968-11	CERAMIC CHIP 0.0047uF 10% 50V	
C425	1-135-181-21	TANTALUM CHIP 4.7uF 20% 6.3V	
C426	1-162-974-11	CERAMIC CHIP 0.01uF 50V	
C427	1-163-809-11	CERAMIC CHIP 0.047uF 10% 25V	
C428	1-126-607-11	ELECT CHIP 47uF 20% 4V	
C429	1-135-157-21	TANTALUM CHIP 10uF 20% 6.3V	
C430	1-135-181-21	TANTALUM CHIP 4.7uF 20% 6.3V	
C431	1-164-634-11	CERAMIC CHIP 1uF 16V	
C432	1-164-634-11	CERAMIC CHIP 1uF 16V	
C433	1-162-974-11	CERAMIC CHIP 0.01uF 50V	
C434	1-162-966-11	CERAMIC CHIP 0.0022uF 10% 50V	
C435	1-162-966-11	CERAMIC CHIP 0.0022uF 10% 50V	
C436	1-162-974-11	CERAMIC CHIP 0.01uF 50V	
C437	1-162-968-11	CERAMIC CHIP 0.0047uF 10% 50V	
C439	1-162-949-11	CERAMIC CHIP 47PF 5% 50V	
C440	1-162-949-11	CERAMIC CHIP 47PF 5% 50V	
C441	1-162-957-11	CERAMIC CHIP 220PF 5% 50V	
C442	1-162-957-11	CERAMIC CHIP 220PF 5% 50V	
C443	1-135-181-21	TANTALUM CHIP 4.7uF 20% 6.3V	
C444	1-135-181-21	TANTALUM CHIP 4.7uF 20% 6.3V	
C445	1-135-091-00	TANTALUM CHIP 1uF 20% 16V	
C446	1-135-091-00	TANTALUM CHIP 1uF 20% 16V	
C447	1-135-157-21	TANTALUM CHIP 10uF 20% 6.3V	
C448	1-135-157-21	TANTALUM CHIP 10uF 20% 6.3V	
C449	1-162-969-11	CERAMIC CHIP 0.0068uF 10% 25V	
C450	1-162-969-11	CERAMIC CHIP 0.0068uF 10% 25V	
C454	1-126-205-11	ELECT CHIP 47uF 20% 6.3V	
C455	1-164-634-11	CERAMIC CHIP 1uF 16V	
C456	1-164-634-11	CERAMIC CHIP 1uF 16V	
C457	1-135-163-21	TANTAL. CHIP 47uF 20% 4V	
C458	1-162-966-11	CERAMIC CHIP 0.0022uF 10% 50V	
C459	1-162-966-11	CERAMIC CHIP 0.0022uF 10% 50V	
C460	1-162-952-11	CERAMIC CHIP 82PF 5% 50V	
C461	1-126-607-11	ELECT CHIP 47uF 20% 4V	
C462	1-162-970-11	CERAMIC CHIP 0.01uF 10% 25V	
C463	1-162-970-11	CERAMIC CHIP 0.01uF 10% 25V	
C464	1-162-970-11	CERAMIC CHIP 0.01uF 10% 25V	
C465	1-164-634-11	CERAMIC CHIP 1uF 16V	
C466	1-162-970-11	CERAMIC CHIP 0.01uF 10% 25V	
C467	1-135-201-11	TANTALUM CHIP 10uF 20% 4V	
C468	1-135-201-11	TANTALUM CHIP 10uF 20% 4V	
C469	1-135-157-21	TANTALUM CHIP 10uF 20% 6.3V	
C470	1-164-634-11	CERAMIC CHIP 1uF 16V	
C471	1-135-202-21	TANTAL. CHIP 22uF 20% 4V	
C472	1-135-202-21	TANTAL. CHIP 22uF 20% 4V	
C473	1-162-970-11	CERAMIC CHIP 0.01uF 10% 25V	
C475	1-164-634-11	CERAMIC CHIP 1uF 16V	
C476	1-164-634-11	CERAMIC CHIP 1uF 16V	
C477	1-164-634-11	CERAMIC CHIP 1uF 16V	
C478	1-164-634-11	CERAMIC CHIP 1uF 16V	
C479	1-164-156-11	CERAMIC CHIP 0.1uF 25V	
C480	1-135-202-21	TANTAL. CHIP 22uF 20% 4V	
C481	1-135-202-21	TANTAL. CHIP 22uF 20% 4V	
C482	1-162-974-11	CERAMIC CHIP 0.01uF 50V	
C483	1-162-974-11	CERAMIC CHIP 0.01uF 50V	
C484	1-162-974-11	CERAMIC CHIP 0.01uF 50V	
C485	1-164-156-11	CERAMIC CHIP 0.1uF 25V	
C486	1-164-005-11	CERAMIC CHIP 0.47uF 25V	
C487	1-162-970-11	CERAMIC CHIP 0.01uF 10% 25V	
C488	1-135-181-21	TANTALUM CHIP 4.7uF 20% 6.3V	
C490	1-135-181-21	TANTALUM CHIP 4.7uF 20% 6.3V	
C491	1-162-970-11	CERAMIC CHIP 0.01uF 10% 25V	
C492	1-162-970-11	CERAMIC CHIP 0.01uF 10% 25V	
C493	1-164-156-11	CERAMIC CHIP 0.1uF 25V	
C494	1-135-181-21	TANTALUM CHIP 4.7uF 20% 6.3V	
C497	1-164-634-11	CERAMIC CHIP 1uF 16V	
C498	1-164-634-11	CERAMIC CHIP 1uF 16V	
C651	1-162-969-11	CERAMIC CHIP 0.0068uF 10% 25V	
C652	1-162-970-11	CERAMIC CHIP 0.01uF 10% 25V	
C655	1-164-634-11	CERAMIC CHIP 1uF 16V	
C990	1-126-205-11	ELECT CHIP 47uF 20% 6.3V	
C991	1-162-974-11	CERAMIC CHIP 0.01uF 50V	
		(FILTER)	
CF301	1-579-371-11	FILTER, CERAMIC 5.17MHz	
		(CONNECTOR)	
CN201	1-691-479-21	CONNECTOR, BOARD TO BOARD 40P	
CN202	1-691-477-21	CONNECTOR, BOARD TO BOARD 28P	
CN400	1-691-490-21	CONNECTOR, FFC/FPC 11P	
		(DIODE)	
D102	8-719-800-76	DIODE 1SS226	
D201	8-719-941-86	DIODE DAN202U	
D202	8-719-941-86	DIODE DAN202U	
D203	8-719-941-09	DIODE DAP202U	
D205	8-719-941-86	DIODE DAN202U	
D206	8-719-941-86	DIODE DAN202U	
D301	8-719-940-45	DIODE DWA010	
D361	8-719-941-86	DIODE DAN202U	
D362	8-719-941-86	DIODE DAN202U	

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(FILTER)

Ref. No.	Part No.	Description	Remark
FL051	1-236-848-21	FILTER, LOW PASS	
FL052	1-239-055-21	FILTER, LOW PASS (CCD.PAL.Y)	
FL053	1-236-834-21	FILTER, LOW PASS	
FL054	1-415-751-21	DELAY LINE, LC (YH)	
FL201	1-239-113-21	FILTER, LOW PASS (REC.Y)	
FL301	1-236-849-21	FILTER, BAND PASS 4.43MHz	
FL302	1-236-186-11	FILTER, BAND PASS	
FL361	1-236-850-21	FILTER, BAND PASS 4.43MHz	
FL400	1-236-837-21	FILTER, BAND PASS	
FL401	1-236-838-21	FILTER, BAND PASS	

(IC)

Ref. No.	Part No.	Description	Remark
IC051	8-752-333-24	IC CXL1506M	
IC052	8-759-710-29	IC NJM2235M	
IC053	8-759-031-84	IC SC7S04F	
IC054	8-752-053-21	IC CXA1211M	
IC201	8-752-036-19	IC CXA1207R	
IC202	8-759-710-29	IC NJM2235M	
IC203	8-759-067-51	IC MB88347PFV-ER	
IC204	8-759-635-27	IC M62352GP	
IC205	8-759-636-33	IC CXA1452N	
IC206	8-752-053-21	IC CXA1211M	
IC301	8-752-036-20	IC CXA1208R	
IC361	8-759-605-61	IC CXA1203N	
IC400	8-759-823-19	IC CXA1488R	
IC401	8-759-823-19	IC CXA1488R	
IC402	8-759-823-21	IC CXA1536Q	

(COIL)

Ref. No.	Part No.	Description	Remark
L051	1-412-026-11	INDUCTOR CHIP 1uH	
L052	1-412-031-11	INDUCTOR CHIP 47uH	
L053	1-412-029-11	INDUCTOR CHIP 10uH	
L054	1-410-656-11	INDUCTOR CHIP 150uH	
L090	1-412-029-11	INDUCTOR CHIP 10uH	
L101	1-412-029-11	INDUCTOR CHIP 10uH	
L102	1-410-385-11	INDUCTOR CHIP 22uH	
L103	1-412-280-31	INDUCTOR 330uH	
L104	1-410-167-41	INDUCTOR CHIP 820uH	
L105	1-410-657-21	INDUCTOR CHIP 180uH	
L109	1-410-657-21	INDUCTOR CHIP 180uH	
L110	1-410-387-11	INDUCTOR CHIP 33uH	
L113	1-410-381-11	INDUCTOR CHIP 10uH	
L114	1-410-380-31	INDUCTOR CHIP 8.2uH	
L115	1-412-280-31	INDUCTOR 330uH	
L116	1-410-655-31	INDUCTOR CHIP 120uH	
L202	1-412-031-11	INDUCTOR CHIP 47uH	
L203	1-412-029-11	INDUCTOR CHIP 10uH	
L204	1-410-393-11	INDUCTOR CHIP 100uH	
L205	1-410-375-11	INDUCTOR CHIP 3.3uH	
L206	1-410-379-31	INDUCTOR CHIP 6.8uH	
L208	1-410-389-31	INDUCTOR CHIP 47uH	
L209	1-410-658-31	INDUCTOR CHIP 220uH	
L210	1-410-370-31	INDUCTOR CHIP 1.2uH	
L211	1-410-390-11	INDUCTOR CHIP 56uH	
L212	1-410-370-31	INDUCTOR CHIP 1.2uH	
L213	1-410-386-11	INDUCTOR CHIP 27uH	
L302	1-410-386-11	INDUCTOR CHIP 27uH	
L303	1-410-393-11	INDUCTOR CHIP 100uH	
L304	1-410-379-31	INDUCTOR CHIP 6.8uH	
L305	1-410-393-11	INDUCTOR CHIP 100uH	
L306	1-410-655-31	INDUCTOR CHIP 120uH	
L307	1-410-656-11	INDUCTOR CHIP 150uH	
L308	1-410-393-11	INDUCTOR CHIP 100uH	

(TRANSISTOR)

Ref. No.	Part No.	Description	Remark
Q051	8-729-920-48	TRANSISTOR IMH2	
Q052	8-729-141-48	TRANSISTOR 2SB624-BV345	
Q053	8-729-905-23	TRANSISTOR 2SA1576-R	
Q054	8-729-905-23	TRANSISTOR 2SA1576-R	
Q055	8-729-120-28	TRANSISTOR 2SC1623-L5L6	
Q056	8-729-120-28	TRANSISTOR 2SC1623-L5L6	
Q057	8-729-120-28	TRANSISTOR 2SC1623-L5L6	
Q060	8-729-120-28	TRANSISTOR 2SC1623-L5L6	
Q061	8-729-120-28	TRANSISTOR 2SC1623-L5L6	
Q063	8-729-422-54	TRANSISTOR XN4215	
Q064	8-729-120-28	TRANSISTOR 2SC1623-L5L6	
Q065	8-729-120-28	TRANSISTOR 2SC1623-L5L6	
Q066	8-729-905-23	TRANSISTOR 2SA1576-R	
Q067	8-729-905-96	TRANSISTOR DTA114TU	
Q103	8-729-120-28	TRANSISTOR 2SC1623-L5L6	
Q104	8-729-120-28	TRANSISTOR 2SC1623-L5L6	
Q110	8-729-920-XX	TRANSISTOR DTA114EU	
Q111	8-729-102-07	TRANSISTOR 2SC2223-F13	
Q114	8-729-120-28	TRANSISTOR 2SC1623-L5L6	
Q118	8-729-920-48	TRANSISTOR IMH2	
Q119	8-729-905-23	TRANSISTOR 2SA1576-R	
Q120	8-729-102-07	TRANSISTOR 2SC2223-F13	
Q122	8-729-120-28	TRANSISTOR 2SC1623-L5L6	
Q202	8-729-905-23	TRANSISTOR 2SA1576-R	
Q204	8-729-120-28	TRANSISTOR 2SC1623-L5L6	
Q207	8-729-905-12	TRANSISTOR DTA144EU	
Q212	8-729-920-48	TRANSISTOR IMH2	
Q213	8-729-905-18	TRANSISTOR DTC144EU	
Q214	8-729-101-07	TRANSISTOR 2SB798-DL	
Q215	8-729-120-28	TRANSISTOR 2SC1623-L5L6	
Q216	8-729-120-28	TRANSISTOR 2SC1623-L5L6	
Q218	8-729-402-81	TRANSISTOR XN4501	
Q220	8-729-120-28	TRANSISTOR 2SC1623-L5L6	
Q222	8-729-402-81	TRANSISTOR XN4501	
Q223	8-729-905-12	TRANSISTOR DTA144EU	

Ref. No.	Part No.	Description		Remark
Q224	8-729-905-18	TRANSISTOR	DTC144EU	
Q225	8-729-905-18	TRANSISTOR	DTC144EU	
Q226	8-729-823-16	TRANSISTOR	2SC4555-5.6.7	
Q227	8-729-920-48	TRANSISTOR	IMH2	
Q228	8-729-120-28	TRANSISTOR	2SC1623-L5L6	
Q229	8-729-120-28	TRANSISTOR	2SC1623-L5L6	
Q230	8-729-905-23	TRANSISTOR	2SA1576-R	
Q231	8-729-925-42	TRANSISTOR	IMT2	
Q232	8-729-905-23	TRANSISTOR	2SA1576-R	
Q233	8-729-925-42	TRANSISTOR	IMT2	
Q235	8-729-905-23	TRANSISTOR	2SA1576-R	
Q302	8-729-402-81	TRANSISTOR	XN4501	
Q304	8-729-905-12	TRANSISTOR	DTA144EU	
Q306	8-729-120-28	TRANSISTOR	2SC1623-L5L6	
Q307	8-729-120-28	TRANSISTOR	2SC1623-L5L6	
Q308	8-729-905-23	TRANSISTOR	2SA1576-R	
Q309	8-729-120-28	TRANSISTOR	2SC1623-L5L6	
Q310	8-729-905-18	TRANSISTOR	DTC144EU	
Q311	8-729-905-23	TRANSISTOR	2SA1576-R	
Q312	8-729-420-20	TRANSISTOR	XN4312	
Q313	8-729-905-12	TRANSISTOR	DTA144EU	
Q314	8-729-120-28	TRANSISTOR	2SC1623-L5L6	
Q315	8-729-905-12	TRANSISTOR	DTA144EU	
Q316	8-729-920-48	TRANSISTOR	IMH2	
Q317	8-729-420-20	TRANSISTOR	XN4312	
Q318	8-729-905-18	TRANSISTOR	DTC144EU	
Q319	8-729-905-18	TRANSISTOR	DTC144EU	
Q361	8-729-102-07	TRANSISTOR	2SC2223-F13	
Q362	8-729-905-18	TRANSISTOR	DTC144EU	
Q363	8-729-120-28	TRANSISTOR	2SC1623-L5L6	
Q364	8-729-905-12	TRANSISTOR	DTA144EU	
Q365	8-729-120-28	TRANSISTOR	2SC1623-L5L6	
Q366	8-729-905-18	TRANSISTOR	DTC144EU	
Q367	8-729-905-18	TRANSISTOR	DTC144EU	
Q368	8-729-905-12	TRANSISTOR	DTA144EU	
Q400	8-729-905-23	TRANSISTOR	2SA1576-R	
Q401	8-729-402-81	TRANSISTOR	XN4501	
Q402	8-729-402-81	TRANSISTOR	XN4501	
Q403	8-729-120-28	TRANSISTOR	2SC1623-L5L6	
Q404	8-729-905-99	TRANSISTOR	DTC114TU	
Q405	8-729-905-99	TRANSISTOR	DTC114TU	
Q406	8-729-905-99	TRANSISTOR	DTC114TU	
Q407	8-729-905-18	TRANSISTOR	DTC144EU	
Q408	8-729-905-18	TRANSISTOR	DTC144EU	
Q409	8-729-402-81	TRANSISTOR	XN4501	
Q411	8-729-905-18	TRANSISTOR	DTC144EU	
Q413	8-729-905-99	TRANSISTOR	DTC114TU	
Q414	8-729-403-27	TRANSISTOR	XN4401	
Q415	8-729-420-20	TRANSISTOR	XN4312	
Q416	8-729-402-81	TRANSISTOR	XN4501	

Ref. No.	Part No.	Description				Remark
Q417	8-729-821-88	TRANSISTOR	2SK1332-3			
Q990	8-729-101-07	TRANSISTOR	2SB798-DL			
Q991	8-729-120-28	TRANSISTOR	2SC1623-L5L6			
		(RESISTOR)				
R051	1-216-833-11	METAL CHIP	10K	5%	1/16W	
R052	1-216-841-11	METAL CHIP	47K	5%	1/16W	
R053	1-216-827-11	METAL CHIP	3.3K	5%	1/16W	
R054	1-216-857-11	METAL CHIP	1M	5%	1/16W	
R055	1-216-810-11	METAL CHIP	120	5%	1/16W	
R056	1-216-844-11	METAL CHIP	82K	5%	1/16W	
R058	1-216-864-11	METAL CHIP	0	5%	1/16W	
R062	1-216-839-11	METAL CHIP	33K	5%	1/16W	
R063	1-216-842-11	METAL CHIP	56K	5%	1/16W	
R064	1-216-817-11	METAL CHIP	470	5%	1/16W	
R065	1-216-821-11	METAL CHIP	1K	5%	1/16W	
R066	1-216-839-11	METAL CHIP	33K	5%	1/16W	
R067	1-216-842-11	METAL CHIP	56K	5%	1/16W	
R068	1-216-821-11	METAL CHIP	1K	5%	1/16W	
R069	1-216-817-11	METAL CHIP	470	5%	1/16W	
R070	1-216-821-11	METAL CHIP	1K	5%	1/16W	
R071	1-216-826-11	METAL CHIP	2.7K	5%	1/16W	
R072	1-216-825-11	METAL CHIP	2.2K	5%	1/16W	
R073	1-216-825-11	METAL CHIP	2.2K	5%	1/16W	
R074	1-216-821-11	METAL CHIP	1K	5%	1/16W	
R075	1-216-821-11	METAL CHIP	1K	5%	1/16W	
R076	1-216-825-11	METAL CHIP	2.2K	5%	1/16W	
R077	1-216-825-11	METAL CHIP	2.2K	5%	1/16W	
R078	1-216-825-11	METAL CHIP	2.2K	5%	1/16W	
R079	1-216-825-11	METAL CHIP	2.2K	5%	1/16W	
R081	1-216-821-11	METAL CHIP	1K	5%	1/16W	
R082	1-216-825-11	METAL CHIP	2.2K	5%	1/16W	
R083	1-216-821-11	METAL CHIP	1K	5%	1/16W	
R085	1-216-827-11	METAL CHIP	3.3K	5%	1/16W	
R086	1-216-827-11	METAL CHIP	3.3K	5%	1/16W	
R088	1-216-847-11	METAL CHIP	150K	5%	1/16W	
R089	1-216-839-11	METAL CHIP	33K	5%	1/16W	
R090	1-216-838-11	METAL CHIP	27K	5%	1/16W	
R091	1-216-829-11	METAL CHIP	4.7K	5%	1/16W	
R092	1-216-837-11	METAL CHIP	22K	5%	1/16W	
R093	1-216-839-11	METAL CHIP	33K	5%	1/16W	
R099	1-216-296-00	METAL CHIP	0	5%	1/8W	
R105	1-216-821-11	METAL CHIP	1K	5%	1/16W	
R106	1-216-821-11	METAL CHIP	1K	5%	1/16W	
R107	1-216-811-11	METAL CHIP	150	5%	1/16W	
R108	1-216-831-11	METAL CHIP	6.8K	5%	1/16W	
R109	1-216-835-11	METAL CHIP	15K	5%	1/16W	
R110	1-216-821-11	METAL CHIP	1K	5%	1/16W	
R111	1-216-813-11	METAL CHIP	220	5%	1/16W	
R114	1-216-819-11	METAL CHIP	680	5%	1/16W	

Ref. No.	Part No.	Description				Remark
R125	1-216-826-11	METAL CHIP	2.7K	5%	1/16W	
R126	1-216-830-11	METAL CHIP	5.6K	5%	1/16W	
R127	1-216-834-11	METAL CHIP	12K	5%	1/16W	
R128	1-216-833-11	METAL CHIP	10K	5%	1/16W	
R129	1-216-817-11	METAL CHIP	470	5%	1/16W	
R130	1-216-823-11	METAL CHIP	1.5K	5%	1/16W	
R131	1-216-824-11	METAL CHIP	1.8K	5%	1/16W	
R132	1-216-808-11	METAL CHIP	82	5%	1/16W	
R133	1-216-830-11	METAL CHIP	5.6K	5%	1/16W	
R137	1-216-821-11	METAL CHIP	1K	5%	1/16W	
R140	1-216-836-11	METAL CHIP	18K	5%	1/16W	
R141	1-216-836-11	METAL CHIP	18K	5%	1/16W	
R142	1-216-821-11	METAL CHIP	1K	5%	1/16W	
R143	1-216-804-11	METAL CHIP	39	5%	1/16W	
R144	1-216-824-11	METAL CHIP	1.8K	5%	1/16W	
R147	1-216-827-11	METAL CHIP	3.3K	5%	1/16W	
R148	1-216-818-11	METAL CHIP	560	5%	1/16W	
R149	1-216-809-11	METAL CHIP	100	5%	1/16W	
R150	1-216-817-11	METAL CHIP	470	5%	1/16W	
R151	1-216-817-11	METAL CHIP	470	5%	1/16W	
R152	1-216-830-11	METAL CHIP	5.6K	5%	1/16W	
R153	1-216-818-11	METAL CHIP	560	5%	1/16W	
R154	1-216-818-11	METAL CHIP	560	5%	1/16W	
R155	1-216-821-11	METAL CHIP	1K	5%	1/16W	
R157	1-216-864-11	METAL CHIP	0	5%	1/16W	
R158	1-216-817-11	METAL CHIP	470	5%	1/16W	
R159	1-216-815-11	METAL CHIP	330	5%	1/16W	
R201	1-216-820-11	METAL CHIP	820	5%	1/16W	
R202	1-216-820-11	METAL CHIP	820	5%	1/16W	
R203	1-216-837-11	METAL CHIP	22K	5%	1/16W	
R205	1-216-864-11	METAL CHIP	0	5%	1/16W	
R207	1-216-824-11	METAL CHIP	1.8K	5%	1/16W	
R208	1-216-804-11	METAL CHIP	39	5%	1/16W	
R209	1-216-804-11	METAL CHIP	39	5%	1/16W	
R211	1-216-820-11	METAL CHIP	820	5%	1/16W	
R212	1-216-821-11	METAL CHIP	1K	5%	1/16W	
R213	1-216-804-11	METAL CHIP	39	5%	1/16W	
R214	1-216-804-11	METAL CHIP	39	5%	1/16W	
R215	1-216-807-11	METAL CHIP	68	5%	1/16W	
R216	1-216-699-11	METAL CHIP	100K	0.5%	1/10W	
R217	1-216-853-11	METAL CHIP	470K	5%	1/16W	
R220	1-216-818-11	METAL CHIP	560	5%	1/16W	
R221	1-216-818-11	METAL CHIP	560	5%	1/16W	
R222	1-216-821-11	METAL CHIP	1K	5%	1/16W	
R223	1-216-821-11	METAL CHIP	1K	5%	1/16W	
R224	1-216-833-11	METAL CHIP	10K	5%	1/16W	
R225	1-216-829-11	METAL CHIP	4.7K	5%	1/16W	
R226	1-216-829-11	METAL CHIP	4.7K	5%	1/16W	
R227	1-216-811-11	METAL CHIP	150	5%	1/16W	
R228	1-216-828-11	METAL CHIP	3.9K	5%	1/16W	
R229	1-216-848-11	METAL CHIP	180K	5%	1/16W	
R230	1-216-829-11	METAL CHIP	4.7K	5%	1/16W	
R231	1-216-826-11	METAL CHIP	2.7K	5%	1/16W	
R232	1-216-653-11	METAL CHIP	1.2K	0.5%	1/10W	
R233	1-216-849-11	METAL CHIP	220K	5%	1/16W	
R234	1-216-829-11	METAL CHIP	4.7K	5%	1/16W	
R235	1-216-819-11	METAL CHIP	680	5%	1/16W	
R236	1-216-827-11	METAL CHIP	3.3K	5%	1/16W	
R237	1-216-827-11	METAL CHIP	3.3K	5%	1/16W	
R239	1-216-643-11	METAL CHIP	470	0.5%	1/10W	
R240	1-216-864-11	METAL CHIP	0	5%	1/16W	
R244	1-216-833-11	METAL CHIP	10K	5%	1/16W	
R246	1-216-833-11	METAL CHIP	10K	5%	1/16W	
R247	1-216-833-11	METAL CHIP	10K	5%	1/16W	
R248	1-216-833-11	METAL CHIP	10K	5%	1/16W	
R249	1-216-864-11	METAL CHIP	0	5%	1/16W	
R250	1-216-841-11	METAL CHIP	47K	5%	1/16W	
R251	1-216-822-11	METAL CHIP	1.2K	5%	1/16W	
R252	1-216-833-11	METAL CHIP	10K	5%	1/16W	
R253	1-216-823-11	METAL CHIP	1.5K	5%	1/16W	
R254	1-216-833-11	METAL CHIP	10K	5%	1/16W	
R255	1-216-864-11	METAL CHIP	0	5%	1/16W	
R256	1-216-810-11	METAL CHIP	120	5%	1/16W	
R257	1-216-813-11	METAL CHIP	220	5%	1/16W	
R258	1-216-827-11	METAL CHIP	3.3K	5%	1/16W	
R260	1-216-815-11	METAL CHIP	330	5%	1/16W	
R262	1-216-815-11	METAL CHIP	330	5%	1/16W	
R263	1-216-820-11	METAL CHIP	820	5%	1/16W	
R264	1-216-864-11	METAL CHIP	0	5%	1/16W	
R265	1-216-839-11	METAL CHIP	33K	5%	1/16W	
R266	1-216-831-11	METAL CHIP	6.8K	5%	1/16W	
R267	1-216-817-11	METAL CHIP	470	5%	1/16W	
R268	1-216-824-11	METAL CHIP	1.8K	5%	1/16W	
R269	1-216-837-11	METAL CHIP	22K	5%	1/16W	
R270	1-216-840-11	METAL CHIP	39K	5%	1/16W	
R271	1-216-829-11	METAL CHIP	4.7K	5%	1/16W	
R272	1-216-829-11	METAL CHIP	4.7K	5%	1/16W	
R275	1-216-837-11	METAL CHIP	22K	5%	1/16W	
R276	1-216-817-11	METAL CHIP	470	5%	1/16W	
R277	1-216-817-11	METAL CHIP	470	5%	1/16W	
R278	1-216-818-11	METAL CHIP	560	5%	1/16W	
R279	1-216-822-11	METAL CHIP	1.2K	5%	1/16W	
R280	1-216-830-11	METAL CHIP	5.6K	5%	1/16W	
R281	1-216-817-11	METAL CHIP	470	5%	1/16W	
R282	1-216-817-11	METAL CHIP	470	5%	1/16W	
R283	1-216-817-11	METAL CHIP	470	5%	1/16W	
R284	1-216-815-11	METAL CHIP	330	5%	1/16W	
R285	1-216-821-11	METAL CHIP	1K	5%	1/16W	
R287	1-216-822-11	METAL CHIP	1.2K	5%	1/16W	
R290	1-216-817-11	METAL CHIP	470	5%	1/16W	

Ref.No.	Part No.	Description				Remark
R291	1-216-817-11	METAL CHIP	470	5%	1/16W	
R292	1-216-817-11	METAL CHIP	470	5%	1/16W	
R294	1-216-829-11	METAL CHIP	4.7K	5%	1/16W	
R295	1-216-821-11	METAL CHIP	1K	5%	1/16W	
R296	1-216-833-11	METAL CHIP	10K	5%	1/16W	
R298	1-216-829-11	METAL CHIP	4.7K	5%	1/16W	
R299	1-216-825-11	METAL CHIP	2.2K	5%	1/16W	
R300	1-216-296-00	METAL CHIP	0	5%	1/8W	
R301	1-216-699-11	METAL CHIP	100K	0.5%	1/10W	
R305	1-216-828-11	METAL CHIP	3.9K	5%	1/16W	
R306	1-216-830-11	METAL CHIP	5.6K	5%	1/16W	
R307	1-216-829-11	METAL CHIP	4.7K	5%	1/16W	
R308	1-216-830-11	METAL CHIP	5.6K	5%	1/16W	
R309	1-216-830-11	METAL CHIP	5.6K	5%	1/16W	
R310	1-216-829-11	METAL CHIP	4.7K	5%	1/16W	
R311	1-216-817-11	METAL CHIP	470	5%	1/16W	
R312	1-216-827-11	METAL CHIP	3.3K	5%	1/16W	
R313	1-216-825-11	METAL CHIP	2.2K	5%	1/16W	
R314	1-216-838-11	METAL CHIP	27K	5%	1/16W	
R315	1-216-834-11	METAL CHIP	12K	5%	1/16W	
R318	1-216-837-11	METAL CHIP	22K	5%	1/16W	
R319	1-216-831-11	METAL CHIP	6.8K	5%	1/16W	
R320	1-216-817-11	METAL CHIP	470	5%	1/16W	
R321	1-216-824-11	METAL CHIP	1.8K	5%	1/16W	
R322	1-216-824-11	METAL CHIP	1.8K	5%	1/16W	
R323	1-216-822-11	METAL CHIP	1.2K	5%	1/16W	
R324	1-216-821-11	METAL CHIP	1K	5%	1/16W	
R326	1-216-821-11	METAL CHIP	1K	5%	1/16W	
R327	1-216-823-11	METAL CHIP	1.5K	5%	1/16W	
R328	1-216-827-11	METAL CHIP	3.3K	5%	1/16W	
R329	1-216-822-11	METAL CHIP	1.2K	5%	1/16W	
R330	1-216-822-11	METAL CHIP	1.2K	5%	1/16W	
R331	1-216-825-11	METAL CHIP	2.2K	5%	1/16W	
R332	1-216-818-11	METAL CHIP	560	5%	1/16W	
R333	1-216-829-11	METAL CHIP	4.7K	5%	1/16W	
R334	1-216-864-11	METAL CHIP	0	5%	1/16W	
R337	1-216-821-11	METAL CHIP	1K	5%	1/16W	
R338	1-216-833-11	METAL CHIP	10K	5%	1/16W	
R339	1-216-825-11	METAL CHIP	2.2K	5%	1/16W	
R340	1-216-825-11	METAL CHIP	2.2K	5%	1/16W	
R341	1-216-833-11	METAL CHIP	10K	5%	1/16W	
R342	1-216-825-11	METAL CHIP	2.2K	5%	1/16W	
R343	1-216-814-11	METAL CHIP	270	5%	1/16W	
R345	1-216-864-11	METAL CHIP	0	5%	1/16W	
R347	1-216-833-11	METAL CHIP	10K	5%	1/16W	
R348	1-216-840-11	METAL CHIP	39K	5%	1/16W	
R351	1-216-821-11	METAL CHIP	1K	5%	1/16W	
R352	1-216-821-11	METAL CHIP	1K	5%	1/16W	
R353	1-216-825-11	METAL CHIP	2.2K	5%	1/16W	
R354	1-216-833-11	METAL CHIP	10K	5%	1/16W	

Ref.No.	Part No.	Description				Remark
R355	1-216-825-11	METAL CHIP	2.2K	5%	1/16W	
R357	1-216-839-11	METAL CHIP	33K	5%	1/16W	
R358	1-216-833-11	METAL CHIP	10K	5%	1/16W	
R359	1-216-821-11	METAL CHIP	1K	5%	1/16W	
R360	1-216-817-11	METAL CHIP	470	5%	1/16W	
R361	1-216-833-11	METAL CHIP	10K	5%	1/16W	
R362	1-216-839-11	METAL CHIP	33K	5%	1/16W	
R363	1-216-833-11	METAL CHIP	10K	5%	1/16W	
R365	1-216-832-11	METAL CHIP	8.2K	5%	1/16W	
R366	1-216-825-11	METAL CHIP	2.2K	5%	1/16W	
R367	1-216-827-11	METAL CHIP	3.3K	5%	1/16W	
R368	1-216-864-11	METAL CHIP	0	5%	1/16W	
R369	1-216-845-11	METAL CHIP	100K	5%	1/16W	
R370	1-216-833-11	METAL CHIP	10K	5%	1/16W	
R372	1-216-833-11	METAL CHIP	10K	5%	1/16W	
R374	1-216-845-11	METAL CHIP	100K	5%	1/16W	
R375	1-216-845-11	METAL CHIP	100K	5%	1/16W	
R378	1-216-827-11	METAL CHIP	3.3K	5%	1/16W	
R379	1-216-845-11	METAL CHIP	100K	5%	1/16W	
R380	1-216-830-11	METAL CHIP	5.6K	5%	1/16W	
R381	1-216-845-11	METAL CHIP	100K	5%	1/16W	
R383	1-216-825-11	METAL CHIP	2.2K	5%	1/16W	
R385	1-216-296-00	METAL CHIP	0	5%	1/8W	
R391	1-216-864-11	METAL CHIP	0	5%	1/16W	
R393	1-216-833-11	METAL CHIP	10K	5%	1/16W	
R400	1-216-833-11	METAL CHIP	10K	5%	1/16W	
R401	1-216-837-11	METAL CHIP	22K	5%	1/16W	
R403	1-216-837-11	METAL CHIP	22K	5%	1/16W	
R404	1-216-859-11	METAL GLAZE	1.5M	5%	1/16W	
R405	1-216-851-11	METAL CHIP	330K	5%	1/16W	
R406	1-216-859-11	METAL GLAZE	1.5M	5%	1/16W	
R409	1-216-839-11	METAL CHIP	33K	5%	1/16W	
R410	1-216-839-11	METAL CHIP	33K	5%	1/16W	
R411	1-216-834-11	METAL CHIP	12K	5%	1/16W	
R412	1-216-834-11	METAL CHIP	12K	5%	1/16W	
R415	1-216-832-11	METAL CHIP	8.2K	5%	1/16W	
R416	1-216-821-11	METAL CHIP	1K	5%	1/16W	
R417	1-216-839-11	METAL CHIP	33K	5%	1/16W	
R418	1-216-821-11	METAL CHIP	1K	5%	1/16W	
R420	1-216-839-11	METAL CHIP	33K	5%	1/16W	
R421	1-216-839-11	METAL CHIP	33K	5%	1/16W	
R423	1-216-833-11	METAL CHIP	10K	5%	1/16W	
R424	1-216-833-11	METAL CHIP	10K	5%	1/16W	
R425	1-216-810-11	METAL CHIP	120	5%	1/16W	
R426	1-216-823-11	METAL CHIP	1.5K	5%	1/16W	
R427	1-216-815-11	METAL CHIP	330	5%	1/16W	
R428	1-216-825-11	METAL CHIP	2.2K	5%	1/16W	
R430	1-216-823-11	METAL CHIP	1.5K	5%	1/16W	
R431	1-216-827-11	METAL CHIP	3.3K	5%	1/16W	
R432	1-216-827-11	METAL CHIP	3.3K	5%	1/16W	

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Ref. No.	Part No.	Description	Remark
R433	1-216-825-11	METAL CHIP 2.2K 5% 1/16W	
R434	1-216-827-11	METAL CHIP 3.3K 5% 1/16W	
R435	1-216-825-11	METAL CHIP 2.2K 5% 1/16W	
R436	1-216-825-11	METAL CHIP 2.2K 5% 1/16W	
R437	1-216-836-11	METAL CHIP 18K 5% 1/16W	
R438	1-216-837-11	METAL CHIP 22K 5% 1/16W	
R439	1-216-836-11	METAL CHIP 18K 5% 1/16W	
R440	1-216-837-11	METAL CHIP 22K 5% 1/16W	
R441	1-216-821-11	METAL CHIP 1K 5% 1/16W	
R442	1-216-821-11	METAL CHIP 1K 5% 1/16W	
R443	1-216-821-11	METAL CHIP 1K 5% 1/16W	
R444	1-216-821-11	METAL CHIP 1K 5% 1/16W	
R445	1-216-818-11	METAL CHIP 560 5% 1/16W	
R446	1-216-849-11	METAL CHIP 220K 5% 1/16W	
R447	1-216-819-11	METAL CHIP 680 5% 1/16W	
R448	1-216-810-11	METAL CHIP 120 5% 1/16W	
R449	1-216-823-11	METAL CHIP 1.5K 5% 1/16W	
R450	1-216-841-11	METAL CHIP 47K 5% 1/16W	
R451	1-216-813-11	METAL CHIP 220 5% 1/16W	
R452	1-216-819-11	METAL CHIP 680 5% 1/16W	
R453	1-216-819-11	METAL CHIP 680 5% 1/16W	
R454	1-216-841-11	METAL CHIP 47K 5% 1/16W	
R455	1-216-813-11	METAL CHIP 220 5% 1/16W	
R456	1-216-813-11	METAL CHIP 220 5% 1/16W	
R457	1-218-716-11	METAL CHIP 10K 0.50% 1/16W	
R458	1-218-714-11	METAL CHIP 8.2K 0.50% 1/16W	
R459	1-218-706-11	METAL CHIP 3.9K 0.50% 1/16W	
R460	1-216-813-11	METAL CHIP 220 5% 1/16W	
R461	1-216-813-11	METAL CHIP 220 5% 1/16W	
R464	1-216-827-11	METAL CHIP 3.3K 5% 1/16W	
R465	1-216-827-11	METAL CHIP 3.3K 5% 1/16W	
R466	1-216-814-11	METAL CHIP 270 5% 1/16W	
R467	1-216-827-11	METAL CHIP 3.3K 5% 1/16W	
R468	1-216-849-11	METAL CHIP 220K 5% 1/16W	
R469	1-216-802-11	METAL CHIP 27 0.50% 1/16W	
R470	1-216-810-11	METAL CHIP 120 5% 1/16W	
R471	1-216-851-11	METAL CHIP 330K 5% 1/16W	
R472	1-216-851-11	METAL CHIP 330K 5% 1/16W	
R476	1-216-832-11	METAL CHIP 8.2K 5% 1/16W	
R478	1-216-849-11	METAL CHIP 220K 5% 1/16W	
R483	1-216-864-11	METAL CHIP 0 5% 1/16W	
R484	1-216-864-11	METAL CHIP 0 5% 1/16W	
R486	1-216-849-11	METAL CHIP 220K 5% 1/16W	
R487	1-216-849-11	METAL CHIP 220K 5% 1/16W	
R488	1-216-864-11	METAL CHIP 0 5% 1/16W	
R490	1-216-864-11	METAL CHIP 0 5% 1/16W	
R494	1-216-864-11	METAL CHIP 0 5% 1/16W	
R495	1-216-849-11	METAL CHIP 220K 5% 1/16W	
R497	1-216-851-11	METAL CHIP 330K 5% 1/16W	
R498	1-216-849-11	METAL CHIP 220K 5% 1/16W	

Ref. No.	Part No.	Description	Remark
R651	1-216-295-00	METAL CHIP 0 5% 1/10W	
R652	1-216-845-11	METAL CHIP 100K 5% 1/16W	
R653	1-216-864-11	METAL CHIP 0 5% 1/16W	
R654	1-216-864-11	METAL CHIP 0 5% 1/16W	
R655	1-216-864-11	METAL CHIP 0 5% 1/16W	
R656	1-216-295-00	METAL CHIP 0 5% 1/10W	
R657	1-216-821-11	METAL CHIP 1K 5% 1/16W	
R658	1-216-864-11	METAL CHIP 0 5% 1/16W	
R659	1-216-841-11	METAL CHIP 47K 5% 1/16W	
R660	1-216-833-11	METAL CHIP 10K 5% 1/16W	
R661	1-216-843-11	METAL CHIP 68K 5% 1/16W	
R662	1-216-833-11	METAL CHIP 10K 5% 1/16W	
R663	1-216-829-11	METAL CHIP 4.7K 5% 1/16W	
R664	1-216-829-11	METAL CHIP 4.7K 5% 1/16W	
R665	1-216-841-11	METAL CHIP 47K 5% 1/16W	
R950	1-216-825-11	METAL CHIP 2.2K 5% 1/16W	
R953	1-216-813-11	METAL CHIP 220 5% 1/16W	
R954	1-216-837-11	METAL CHIP 22K 5% 1/16W	
R955	1-216-834-11	METAL CHIP 12K 5% 1/16W	
R956	1-216-825-11	METAL CHIP 2.2K 5% 1/16W	
R957	1-216-829-11	METAL CHIP 4.7K 5% 1/16W	
R958	1-216-815-11	METAL CHIP 330 5% 1/16W	
R960	1-216-817-11	METAL CHIP 470 5% 1/16W	
R961	1-216-821-11	METAL CHIP 1K 5% 1/16W	
R962	1-216-815-11	METAL CHIP 330 5% 1/16W	
R963	1-216-840-11	METAL CHIP 39K 5% 1/16W	
R964	1-216-836-11	METAL CHIP 18K 5% 1/16W	
R965	1-216-821-11	METAL CHIP 1K 5% 1/16W	
R966	1-216-295-00	METAL CHIP 0 5% 1/10W	
R990	1-216-830-11	METAL CHIP 5.6K 5% 1/16W	
R991	1-216-138-00	METAL CHIP 3.3 5% 1/8W	
R995	1-216-820-11	METAL CHIP 820 5% 1/16W	
R996	1-216-836-11	METAL CHIP 18K 5% 1/16W	

(CONPOSITION CIRCUIT BLOCK)

Ref. No.	Part No.	Description	Remark
RB101	1-236-428-11	NETWORK, RES 22K	
RB201	1-236-424-11	NETWORK, RES 10K	
RB301	1-236-414-11	NETWORK, RES 1.5K	

(VARIABLE RESISTOR)

Ref. No.	Part No.	Description	Remark
RV051	1-238-087-11	RES, ADJ, CERMET 1K	
RV051	1-238-853-11	RES, ADJ, CERMET 1K	

(THERMISTOR)

Ref. No.	Part No.	Description	Remark
TH101	1-809-357-21	THERMISTOR, NTC (2125) 10K	

(VIBRATOR)

Ref. No.	Part No.	Description	Remark
X301	1-577-117-21	OSCILLATOR, CRYSTAL (4.433619MHz)	

****

Ref. No.	Part No.	Description	Remark
*	A-7063-129-A	VF-44 BOARD, COMPLETE	
		************************	
		(Ref. No 2,000 Series)	
		〈 CAPACITOR 〉	
C501	1-163-115-00	CERAMIC CHIP 82PF 5% 50V	
C502	1-126-176-11	ELECT 220uF 20% 10V	
C503	1-163-077-00	CERAMIC CHIP 0.1uF 10% 25V	
C504	1-163-009-11	CERAMIC CHIP 0.001uF 10% 50V	
⚠C505	1-163-053-00	CERAMIC CHIP 0.0033uF 10% 50V	
⚠C506	1-163-058-00	CERAMIC CHIP 0.0082uF 10% 50V	
C508	1-127-515-11	ELECT(SOLID) 47uF 20% 6.3V	
C509	1-126-090-11	ELECT 82uF 20% 10V	
C510	1-164-611-11	CERAMIC CHIP 0.001uF 10% 500V	
C511	1-124-257-00	ELECT 2.2uF 20% 50V	
C512	1-163-037-11	CERAMIC CHIP 0.022uF 10% 25V	
C513	1-137-306-11	FILM CHIP 0.1uF 5% 16V	
C514	1-162-638-11	CERAMIC CHIP 1uF 16V	
C515	1-131-381-00	TANTALUM 47uF 10% 10V	
C516	1-163-037-11	CERAMIC CHIP 0.022uF 10% 25V	
C517	1-135-091-00	TANTALUM CHIP 1uF 20% 16V	
		〈 CONNECTOR 〉	
* CN501	1-566-762-11	PIN, CONNECTOR (PC BOARD) 7P	
* CN502	1-566-195-11	PIN, CONNECTOR (PC BOARD) 2P	
* CN503	1-566-195-11	PIN, CONNECTOR (PC BOARD) 2P	
		〈 DIODE 〉	
D501	8-719-024-87	DIODE LN1261CAL	
D502	8-719-024-87	DIODE LN1261CAL	
D503	8-719-400-20	DIODE MA152WA	
		〈 IC 〉	
IC501	8-759-420-01	IC AN2512S	
		〈 COIL 〉	
L501	1-412-031-11	INDUCTOR CHIP 47uH	
L502	1-410-385-11	INDUCTOR CHIP 22uH	
⚠L503	1-460-220-11	COIL, FERRITE (HLC)	
		〈 TRANSISTOR 〉	
Q501	8-729-216-31	TRANSISTOR 2SA1163-G	
Q503	8-729-106-68	TRANSISTOR 2SD1615A-GP	
		〈 RESISTOR 〉	
R501	1-216-063-00	METAL CHIP 3.9K 5% 1/10W	
R502	1-216-061-00	METAL CHIP 3.3K 5% 1/10W	
R503	1-216-063-00	METAL CHIP 3.9K 5% 1/10W	
R504	1-216-041-00	METAL CHIP 470 5% 1/10W	
R505	1-216-041-00	METAL CHIP 470 5% 1/10W	

Ref. No.	Part No.	Description	Remark
R508	1-216-005-00	METAL CHIP 15 5% 1/10W	
R509	1-216-870-11	METAL CHIP 180K 1% 1/10W	
R510	1-216-079-00	METAL CHIP 18K 5% 1/10W	
R511	1-216-133-00	METAL CHIP 3.3M 5% 1/10W	
R512	1-216-133-00	METAL CHIP 3.3M 5% 1/10W	
R513	1-216-125-00	METAL CHIP 1.5M 5% 1/10W	
R514	1-216-121-00	METAL CHIP 1M 5% 1/10W	
R515	1-216-055-00	METAL CHIP 1.8K 5% 1/10W	
R516	1-216-025-00	METAL CHIP 100 5% 1/10W	
R517	1-216-308-00	METAL CHIP 4.7 5% 1/10W	
R518	1-216-336-11	METAL CHIP 47K 1% 1/10W	
R519	1-216-107-00	METAL CHIP 270K 5% 1/10W	
R520	1-216-121-00	METAL CHIP 1M 5% 1/10W	
R521	1-216-160-00	METAL GLAZE 27 5% 1/8W	
R522	1-216-053-00	METAL CHIP 1.5K 5% 1/10W	
R523	1-216-113-00	METAL CHIP 470K 5% 1/10W	
R524	1-216-097-00	METAL CHIP 100K 5% 1/10W	
R525	1-216-031-00	METAL CHIP 180 5% 1/10W	
R526	1-216-748-11	METAL CHIP 39K 1% 1/10W	
		〈 VARIABLE RESISTOR 〉	
RV501	1-238-088-11	RES, ADJ, CERMET 2.2K	
RV502	1-241-497-11	RES, ADJ, METAL GLAZE 4.7M	
RV503	1-238-096-11	RES, ADJ, CERMET 1M	
RV504	1-238-092-11	RES, ADJ, CERMET 47K	
RV505	1-238-086-11	RES, ADJ, CERMET 470	
		〈 SWITCH 〉	
S501	1-692-032-21	SWITCH, TACTILE (HORIZONTAL)(EDIT (+))	
S502	1-692-032-21	SWITCH, TACTILE (HORIZONTAL)(EDIT (-))	
		〈 TRANSFORMER 〉	
⚠T501	1-439-525-11	TRANSFORMER ASSY, FLYBACK	
		〈 THERMISTOR 〉	
TH501	1-809-350-21	THERMISTOR, NTC (2125) 500	
		〈 FLAT CABLE 〉	
W502	1-526-978-51	SOCKET ASSY, CRT 5P	

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Ref. No.	Part No.	Description	Remark
*	A-7071-579-A	VK-24 BOARD, COMPLETE (AEP, UK)	
		************************	
*	A-7071-702-A	VK-24 BOARD, COMPLETE (E, AUS)	
		************************	
		(Ref. No 4,000 Series)	
		〈 CONNECTOR 〉	
CN571	1-691-488-21	CONNECTOR, FFC/FPC 9P	
CN574	1-691-483-21	CONNECTOR, FFC/FPC 4P	
* CN575	1-580-055-21	PIN, CONNECTOR 2P	

The components identified by mark ⚠ or dotted line with mark ⚠ are critical for safety.
Replace only with part number specified.

Ref. No.	Part No.	Description	Remark
		(DIODE)	
D570	8-719-820-05	DIODE 1SS181	
		(SWITCH)	
S570	1-572-498-11	SWITCH, SLIDE (EJECT)	
S571	1-572-921-31	SWITCH, KEY BOARD (REW)	
S572	1-572-921-31	SWITCH, KEY BOARD (FF)	
S573	1-572-921-31	SWITCH, KEY BOARD (PLAY)	
S574	1-572-921-31	SWITCH, KEY BOARD (STOP)	
S575	1-572-498-11	SWITCH, SLIDE (REC)(E, AUS)	
S576	1-572-921-31	SWITCH, KEY BOARD (PAUSE)	
		(FLAT CABLE)	
W570	1-643-075-11	FP-6 FLEXIBLE BOARD 22P	
W573	1-690-774-11	CABLE, FLAT (FFC-56) 11P	

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MISCELLANEOUS
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Ref. No.	Part No.	Description	Remark
13	1-550-743-11	HOLDER, BATTERY	
25	1-542-162-11	MICROPHONE UNIT	
32	1-690-604-11	CABLE, FLAT (FFC-33) 4P	
36	1-537-415-11	TERMINAL BOARD	
40	1-241-855-11	RES VAR, CARBON (uF) 50K	
⚠57	1-451-310-21	DEFLECTION YOKE (B/W)	
77	1-809-663-11	DISPLAY PANEL, LIQUID CRYSTAL	
105	1-692-025-11	SWITCH, PUSH	
117	1-691-471-11	CONNECTOR, TRANSLATION 11P	
132	1-547-558-21	FILTER BLOCK, OPTICAL	
133	1-547-541-11	LENS, ZOOM (VCL-6110WB)(TYPE I)	
133	1-547-561-21	LENS, ZOOM (VCL-6110WC)(TYPE II)	
351	1-547-541-11	LENS, ZOOM (VCL-6110WB)(TYPE I)	
361	1-547-561-21	LENS, ZOOM (VCL-6110WC)(TYPE II)	
IC901	A-7030-331-A	CCD BLOCK ASSY (AUTO)(CCD IMAGER)	
M901	A-7048-585-A	DRUM ASSY (DGH-90A-R)	
M902	8-835-477-01	MOTOR, DC SCE-0101A (CAPSTAN)	
M903	A-7040-304-A	MOTOR BLOCK ASSY, LM (LOADING)	
M904	3-708-385-01	IRIS ASSY (TYPE I)	
M904	3-708-486-01	METER ASSY, IG (IRIS)(TYPE II)	
M905	3-708-389-01	MOTOR ASSY, FOCUS (TYPE I)	
M905	3-708-489-01	MOTOR ASSY, AF (FOCUS)(TYPE II)	
M906	3-708-387-01	MOTOR ASSY, ZOOM (TYPE I)	
M906	3-708-487-01	MOTOR ASSY, PZ (ZOOM)(TYPE II)	
S001	1-572-986-11	SWITCH, ROTARY (ENCODER)	
S002	1-572-987-11	SWITCH, PUSH (3KEY) (REC PROOF, ME/MP, MP/MP-HG)	
S005	1-570-771-21	SWITCH (C DOWN)	
⚠V901	1-546-091-11	CATHODE-RAY TUBE, B/W	
⚠W502	1-526-948-51	SOCKET ASSY, CRT	

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ACCESSORIES & PACKING MATERIALS
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Ref. No.	Part No.	Description	Remark
	1-571-164-11	SWITCH, ANTENNA CHANGE (CABLE)(UK, E)	
	1-573-291-11	CONNECTOR, CONVERSION (AEP, UK)	
	1-575-334-11	CORD, CONNECTION	
*	1-693-017-11	REMOTE COMMANDER (CAM CODER)(RMT-509)	
	3-712-673-01	SCREWDRIVER (UK, E)	
	3-738-517-01	BELT (S), SHOULDER	
	3-947-500-01	LID, BATTERY CASE	
	3-948-408-01	CUSHION (UPPER)	
*	3-754-318-01	INSTRUCTION (AEP, E)	
	3-755-144-51	MANUAL, INSTRUCTION (ENGLISH)(E, Australian)	
	3-755-144-61	MANUAL, INSTRUCTION (FRENCH, GERMAN, SPANISH)(E)	
	3-755-144-71	MANUAL, INSTRUCTION (ARABIC)(E)	
	3-755-144-81	MANUAL, INSTRUCTION (CHINESE)(E)	
	3-755-145-11	MANUAL, INSTRUCTION (ENGLISH)(AEP, UK)	
	3-755-145-41	MANUAL, INSTRUCTION (FRENCH, GERMAN, SPANISH)(AEP)	
	3-755-145-51	MANUAL, INSTRUCTION (DUTCH, SWEDISH, ITALIAN)(AEP)	
*	3-947-110-21	INDIVIDUAL CARTON	
*	3-947-112-01	CUSHION (LOWER)	
	9-910-999-32	BAG, PROTECTION (AEP)	
	3-755-145-61	MANUAL, INSTRUCTION (PORTUGUESE)(AEP)	
	3-755-145-71	MANUAL, INSTRUCTION (DANISH, FINNISH)(AEP)	
	A-6768-254-A	RFU ADAPTOR (RFU-90E)(AEP)	
	A-6767-707-A	RFU ADAPTOR (RFU-89EA)(UK)	
	A-6767-706-A	RFU ADAPTOR (RFU-89EA)(E)	
	A-6768-255-A	RFU ADAPTOR (RFU-90AS)(Australian)	
**	AC-V25S	AC POWER ADAPTOR	
***	NP-55H	BATTERY PACK	

Note.

** MARK PARTS IS AVAILABLE FOR REPAIR SERVICE.
*** MARK PARTS IS AVAILABLE AS AN OPTIONAL ACCESSORY.

The components identified by mark ⚠ or dotted line with mark ⚠ are critical for safety.
Replace only with part number specified.

SECTION 7

CAMERA SECTION ADJUSTMENTS

When performing adjustments, refer to the layout diagrams for adjustment related parts beginning from page 214.

7-1. PREPARATIONS BEFORE ADJUSTMENT (CAMERA SECTION)

7-1-1. List of Service Tools

- Oscilloscope
- Adjusting driver
- Stabilized power supply
- Color monitor
- Vectorscope
- Digital voltmeter

Ref. No.	Name	Part Code	Usage
J-1	Filter for color temperature correction (C14)	J-6080-058-A	Auto white balance adjustment/check White balance adjustment/check
J-2	ND filter 1.0	J-6080-808-A	Max gain adjustment (2 used) White balance check
	ND filter 0.4	J-6080-806-A	Max gain adjustment
	ND filter 0.3	J-6080-818-A	White balance adjustment
	ND filter 0.1	J-6080-807-A	Max gain adjustment
J-3	Pattern box PTB-500	J-6029-140-A	
J-4	Color chart for pattern box	J-6020-250-A	
J-5	Adjusting remote control unit (RM-95-remodeled in part)[Note 1]	J-6082-053-A	
J-6	Siemens star	J-6080-875-A	Flange back check
J-7	Measuring pin for camera section	J-6082-139-A	For the camera section adjustment
J-8	Extension cord (30P, 0.8 mm)	J-6082-167-A	For extension of CS-35 board (For the mecha deck check)
J-9	Extension cord (40P, 0.8 mm)	J-6082-168-A	For extension of VA-74 board (For the video section adjustment)
	Extension cord (28P, 0.8 mm)	J-6082-174-A	For extension of VA-74 board (For the video section adjustment)
	Extension cord (18P, 0.8 mm)	J-6082-170-A	For extension of CD-76 board (For the repair of the camera section)
J-10	Extension cord (21P, 0.5 mm)	J-6082-171-A	For extension of lens block (For the repair of the camera section)
J-11	Extension cord (15P, 0.8 mm)	J-6082-172-A	For extension of cabinet L (PJ-47, VK-24 boards) (For the video section adjustment)
	Extension cord (8P, 0.8 mm)	J-6082-173-A	For extension of cabinet L (PJ-47, VK-24 boards) (For the video section adjustment)

Note: If the micro processor IC in the adjusting remote control unit is not the new micro processor (UPD7503G-C56-12), the switchover of the page cannot be carried out. In this case, replace with the new micro processor (8-759-148-35).

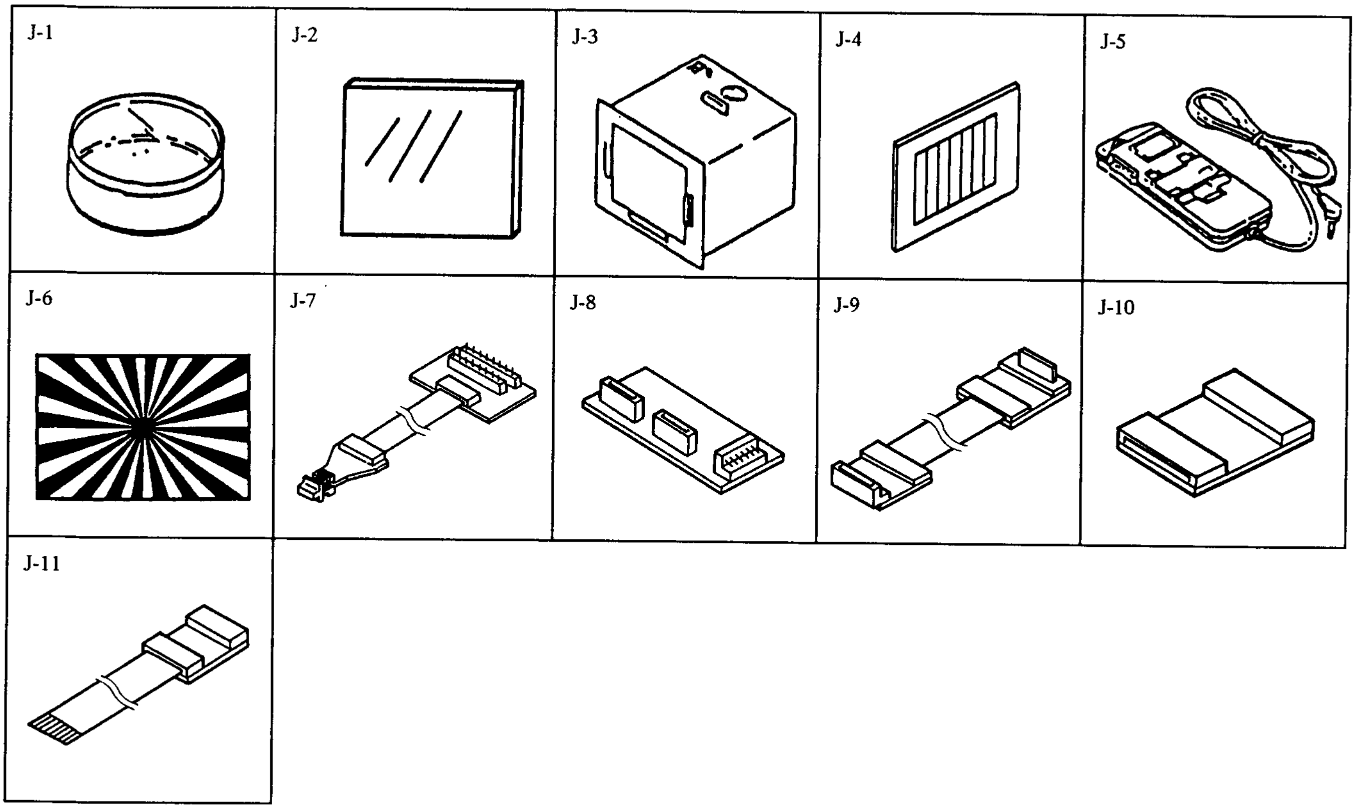

J-1
J-2
J-3
J-4
J-5
J-6
J-7
J-8
J-9
J-10
J-11

Fig. 7-1.

7-1-2. Preparations

Note: For further details on how to remove the cabinet and each board, refer to "1. Disassembly".

1) Connect the equipments for adjustment as shown in Fig. 7-3.

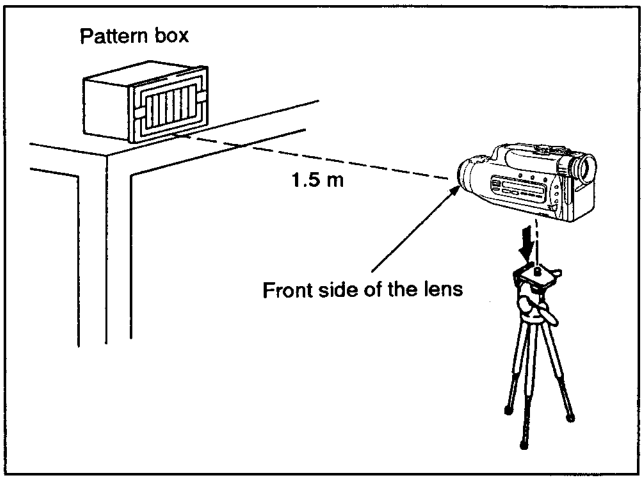
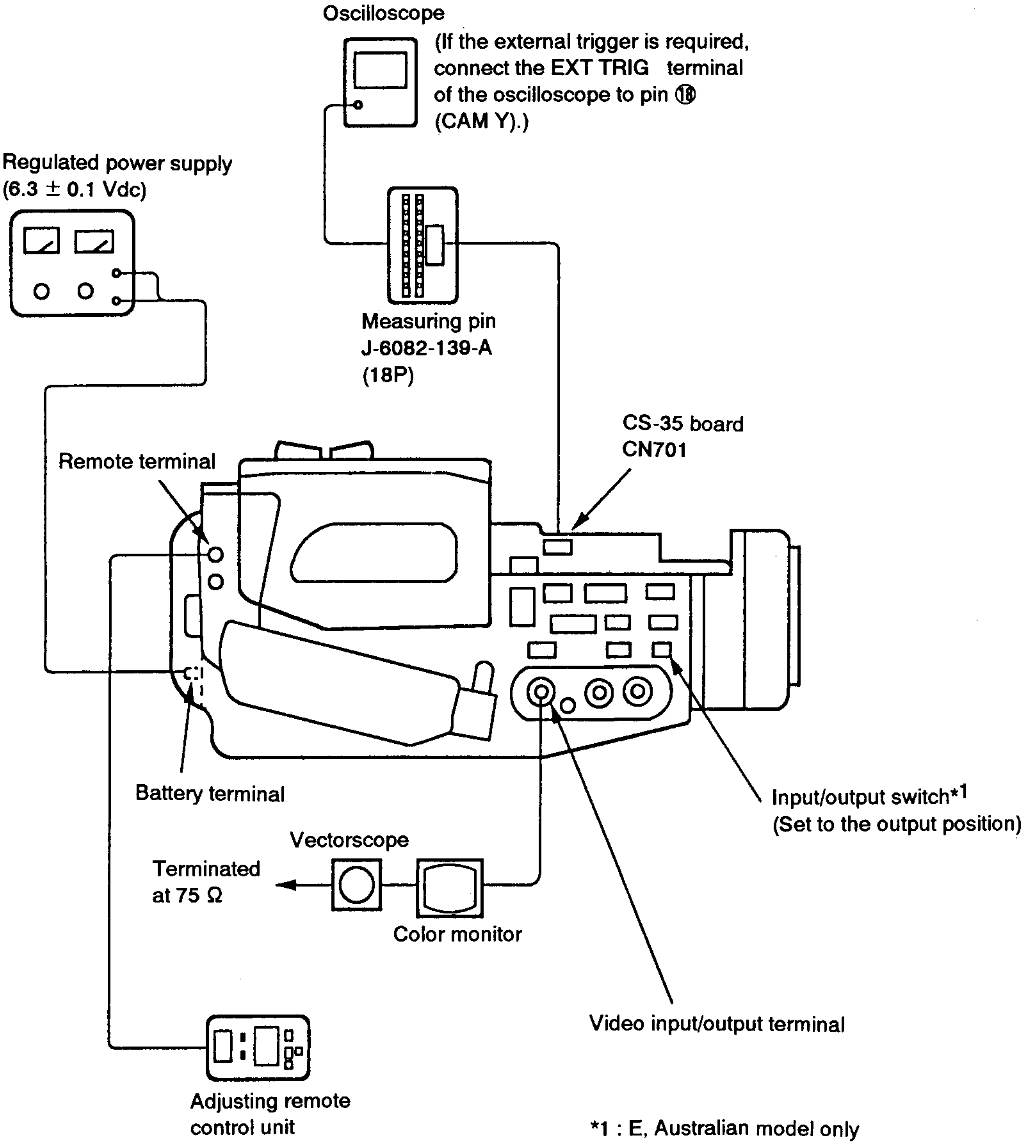

Pattern box
1.5 m
Front side of the lens

Fig. 7-2.


Oscilloscope
(If the external trigger is required, connect the EXT TRIG terminal of the oscilloscope to pin ⑱ (CAM Y).)
Regulated power supply
(6.3 ± 0.1 Vdc)
Measuring pin
J-6082-139-A
(18P)
CS-35 board
CN701
Remote terminal
Battery terminal
Input/output switch*1
(Set to the output position)
Vectorscope
Terminated at 75 Ω
Color monitor
Video input/output terminal
Adjusting remote control unit

*1 : E, Australian model only

Fig. 7-3.

7-1-3. Precautions

1. Switch settings

Adjust the switches to the following positions, and perform the adjustments without inserting the tape, unless specified otherwise.

1. Camera/video power switch (PK-32 board S540) ·····Camera
2. Standby switch (SW-201 board S581)·················· Standby
3. AUTO LOCK switch (CK-56 board S568)················ OFF
4. Input/output switchover switch (PJ-47 board S551)*1 ···Output
5. Back light button (CK-56 board S567) ·······················Off
6. PROGRAM AE button (CK-56 board S569)················Off

*1 : E, Australian model only.

2. Adjustment Procedure

Perform in the given order as a rule.

3. Subject

1) Color bar chart (Standard picture frame)
   Adjust the display frame as shown in Fig. 7-4. if adjustments are performed using the color bar chart. (Standard picture frame)
2) White pattern (Standard picture frame)
   Remove the color bar chart from the pattern box, and adjust the zoom lever so that the white pattern becomes the same size and is in the same position as the color bar chart (Standard picture frame).

Color bar chart standard picture frame

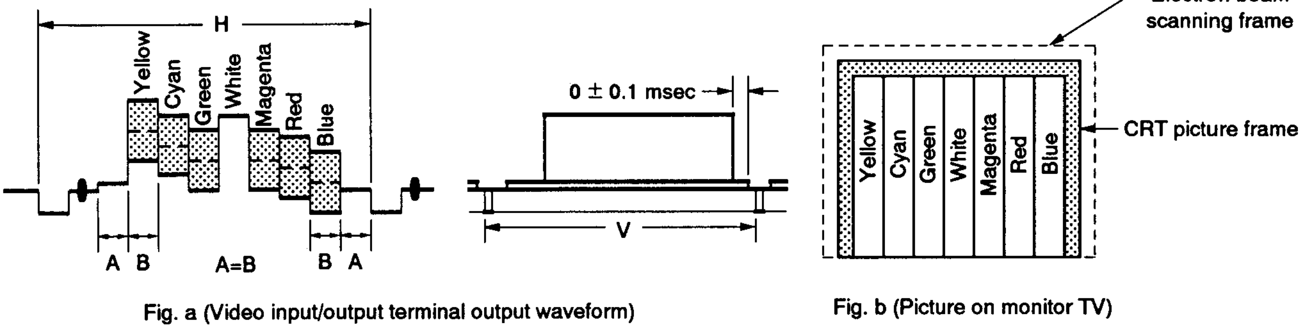

H
Yellow
Cyan
Green
White
Magenta
Red
Blue
A B
A=B
B A
0 ± 0.1 msec
V
Electron beam scanning frame
CRT picture frame
Yellow
Cyan
Green
White
Magenta
Red
Blue

Fig. a (Video input/output terminal output waveform)

Fig. b (Picture on monitor TV)

Adjust the zooming and direction of the camera to obtain the output waveform shown in Fig. a and the monitor TV picture shown in Fig. b.

Fig. 7-4.

3) Chart for flange back adjustment
   Combine a white A0 size (1189 mm× 841 mm) paper to a black one, and make the chart shown in Fig. 7-5.

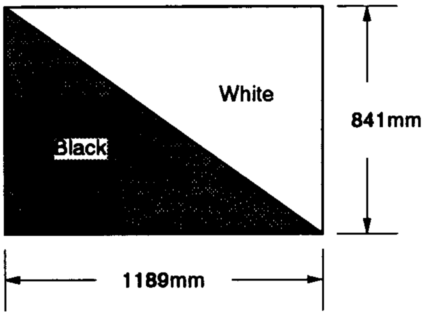

White
Black
841mm
1189mm

Fig. 7-5.

Note: Use the non-reflecting and non-glazing vellum paper whose size is more than A0, and make the boundary between white and black to be smoothly flat.

7-1-4. Adjusting Remote Control Unit

The camera section is adjusted by changing the constant using the coefficient of the digital signal processing calculation, or modifying the output voltage of EVR IC (CS-35 board IC702). These processes are carried out by the camera micro processor (CS-35 board IC709). This micro processor reads the data written in the non-volatile memory (CS-35 board IC712), and transmits it to the digital signal processing circuit and EVR.

The adjusting remote control unit is used for rewriting the adjustment data written in the non-volatile memory necessary for performing the adjustments.

The adjusting remote control unit uses the remote control signal line (LANC) to correspond mutually with the camera micro processor. The page, address and the up/down command of the data can be transmitted from the remote control unit to the camera micro processor. On the other hand, the page, address, and data can also be transmitted the other way round.

1. Using the adjusting remote control unit

1) Connect the adjusting remote control unit to the remote terminal (PS-300 board J951).
2) Adjust the HOLD switch of the adjusting remote control unit to HOLD (SERVICE position).
   If it has been properly connected, the LCD on the adjusting remote control unit will show the display in Fig. 7-6.

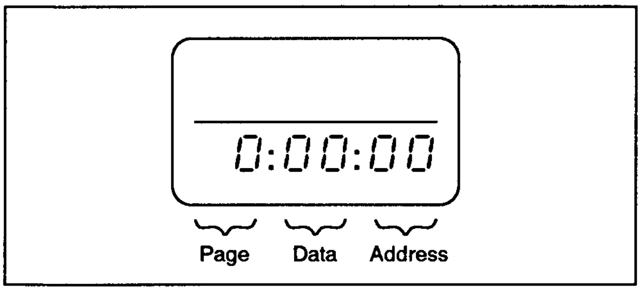


Fig. 7-6.

3) Operate the adjusting remote control unit as follows.
   - Changing the page
     The page will increase when the EDIT SEARCH+ button is pressed. It will decrease when the EDIT SEARCH– button is pressed. There are altogether 16 pages, from 0 to F.

Hexadecimal notation	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
Display on LCD	0	1	2	3	4	5	6	7	8	9	A	b	c	d	E	F
Decimal notation conversion value	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15

Table 7-1.

   - Changing the address
     The address will increase when the FF (▶▶) button is pressed, and decrease when the REW (◀◀) button is pressed. There are altogether 256 addresses, from 00 to FF.
   - Changing the data (Data setting)
     The data will increase when the PLAY (▶) button is pressed, and decrease when the STOP (■) button is pressed.
     There are altogether 256 data, from 00 to FF.
   - Writing the adjustment data
     It is necessary to press the PAUSE button to write the adjustment data (F page, D page) in the non-volatile memory.
     (The new adjustment data will not be recorded in the non-volatile memory if this operation is not performed.)
4) Select page: 6, address: 00, and adjust the data to 01. This releases the write protect of page F, and the camera section (F page) can be adjusted.
   (To adjust the titler system (D page), adjust the data of page: 1, address: 00 to 01, and release the protect of page D.)
5) After completing all adjustments, turn off the main power (6.3V) once. This can release the adjustment mode (other than page F).

2. Precautions upon using the adjusting remote control unit

The correct adjustment data may be erased at times, due to operation errors of the adjusting remote control unit. To prevent this from occurring, it is recommended that all adjustment data be recorded in the memory before beginning adjustments, and the new adjustment data be recorded in the memory after each adjustment.

7-1-5. Page F Address List

Note 1: The data listed in the adjustment data memo column are fixed values.

Note 2: The adjustment data initial values are the values after performing "Page F Data Initialization" and "Page F Data Modification". They are different from the value after performing all the adjustments.

Address	Name	Function [ ] Indicate the adjustment voltage output terminal	Adjustment data Initial value	Adjustment data Memo column
00	ID	Set ID	00	2D
01	FADER LEVEL	AE REF level modification during fader	E0	E0
02	FADER ENDTIM	The setting of the AE REF modulation time during fader	10	10
03	CS SL	Carrier balance adjustment	35	
04	VSUB	CCD imager V SUB adjustment [IC702 ③]	80	
05	VPGH	CCD imager VRG adjustment [IC702 ④]	80	
06	VREF Y	Camera core Y D/A standard voltage, SYNC level adjustment [IC702 ⑤]	7B	
07	VREF C	Camera core CHROMA D/A standard voltage, BURST level adjustment [IC702 ⑥]	99	
08	HALL GAIN	Hole amplifier gain adjustment [IC702 ⑦] HALL adjustment	47	
09	HALL OFFSET	Hole amplifier offset adjustment [IC702 ⑧]	71	
0A	E LOWLIGHT START	Low luminance intensity REF level modulation start setting	30	30
0B	REF 2V	2V standard voltage for hole element [IC702 ⑫]	68	68
0C	AD REF	Black level setting during A/D conversion, A/D off set adjustment [IC702 ⑬]	72	
0D	CORE DETH	CCD correction control	04	04
0E	CORE VTR DELAY	1HDL longitudinal setting during VTR playback	16	16
0F	CORE APCN4	Horizontal aperture setting	A5	A5
10	CORE APCN5	Vertical aperture setting	3D	3D
11	CORE EFECT	Special effect control	A0	A0
12	CORE MATR	BLUE matrix constant	27	27
13	CORE MATB	RED matrix constant	6C	6C
14	CORE BURST LEVEL	Burst flag level setting, color modulation ON/OFF Data — Adjustment modeAdjustment 38 — Normal level 2E — Color modulation stopped	38	38
15	CORE CHROMA DLY	Y/C delay adjustment	03	03
16	CORE Y SETUP	Set up level setting	03	03
17	CORE VHAPCN	Slice and level setting of the aperture signal	17	17
18	CORE B-Y GAIN	B–Y GAIN — Color reproduction adjustments	13	
19	CORE R-Y GAIN	R–Y GAIN	11	
1A	CORE R-Y HUE	R–Y HUE	FF	
1B	CORE B-Y HUE	B–Y HUE	FD	
1C	CS/APCCUT	Low luminance intensity aperture and chroma suppress level	22	22

Table 7-2 (1).

Address	Name	Function [ ] indicate the adjustment voltage output terminal		Adjustment data	
				Initial value	Memo column
1D	NEXT LINE DEFECT BIT	CCD correction pattern	CCD imager correction data write	00	
1E	CCD DEFECT0	CCD correction data		00	
1F	CCD DEFECT1	CCD correction data		00	
20	CCD DEFECT2	CCD correction data		00	
21	CCD DEFECT3	CCD correction data		00	
22	CCD DEFECT4	CCD correction data		00	
23	CCD DEFECT5	CCD correction data		00	
24	CCD DEFECT6	CCD correction data		00	
25	CCD DEFECT7	CCD correction data		00	
26	CCD DEFECT8	CCD correction data		00	
27	CCD DEFECT9	CCD correction data		00	
28	CCD DEFECT10	CCD correction data		00	
29	CCD DEFECT11	CCD correction data		00	
2A	CCD DEFECT12	CCD correction data		00	
2B	CCD DEFECT13	CCD correction data		00	
2C	CCD DEFECT14	CCD correction data		00	
2D	RREF L	3200k Red standard data LSB	Auto white balance preset adjustment	72	
2E	RREF H	3200k Red standard data MSB		5F	
2F	GREF L	3200k Green standard data LSB		D4	
30	GREF H	3200k Green standard data MSB		63	
31	BREF L	3200k Blue standard data LSB		3B	
32	BREF H	3200k Blue standard data MSB		2C	
33	RCONTREF	3200k RCONT adjustment value	Pre-white balance adjustment	42	
34	BCONTREF	3200k BCONT adjustment value		4A	
35	AWB NOWM R	Red regular correction coefficient	Auto white balance adjustment	7E	
36	AWB NORM B	Blue regular correction coefficient		96	
37	AWB SHUT IN	Indoor determination shutter data		A8	A8
38	ABW SHUT OUT	Outdoor determination shutter data		A0	A0
39	AWB IRIS IN	Indoor determination hole data	IRIS IN/OUT adjustment	79	
3A	AWB IRIS OUT	Outdoor determination hole data		7F	
3B	AWB G LEVEL	High luminance section green integral level		02	02
3C	AWB G WIDTH	High luminance section green integral level range		03	03
3D	DMAT HUE	Variable linear matrix HUE coefficient	Linear matrix adjustment	00	
3E	DMAT GAIN	Variable linear matrix GAIN coefficient		00	
3F	AWB SELECT	AWB mode selection		00	00
40	AWB DIFF	Standard difference from the outdoor fixed value		0A	0A
41	AWB BOTTOM SLP R	AWB incoming frame bottom R coefficient		48	48
42	AWB BOTTOM SLP B	AWB incoming frame bottom B coefficient		78	78
43	AWB MIDDLE SLP R	AWB incoming frame middle R coefficient		60	60
44	AWB MIDDLE SLP B	AWB incoming frame middle B coefficient		40	40
45	AWB TOP SLP R	AWB incoming frame top R coefficient		66	66
46	AWB TOP SLP B	AWB incoming frame top B coefficient		18	18
47	AWB KEIKO R	AWB incoming frame fluorescent light R coefficient		66	66
48	AWB KEIKO B	AWB incoming frame fluorescent light B coefficient		18	18
49	AWB BOTTOM UP	AWB incoming frame bottom upper value		C2	C2

Table 7-2 (2).

<table>
<tr><th rowspan="2">Address</th><th rowspan="2">Name</th><th rowspan="2">Function
[ ] Indicate the adjustment voltage output terminal</th><th colspan="2">Adjustment data</th></tr>
<tr><th>Initial value</th><th>Memo column</th></tr>
<tr><td>4A</td><td>AWB BOTTOM DWN</td><td>AWB incoming frame bottom lower value</td><td>8C</td><td>8C</td></tr>
<tr><td>4B</td><td>AWB MIDDLE UP</td><td>AWB incoming frame middle upper value</td><td>AD</td><td>AD</td></tr>
<tr><td>4C</td><td>AWB MIDDLE DWN</td><td>AWB incoming frame middle lower value</td><td>96</td><td>96</td></tr>
<tr><td>4D</td><td>AWB TOP UP</td><td>AWB incoming frame top upper value</td><td>78</td><td>78</td></tr>
<tr><td>4E</td><td>AWB TOP DWN</td><td>AWB incoming frame top lower value</td><td>60</td><td>60</td></tr>
<tr><td>4F</td><td>AWB KEIKO</td><td>AWB incoming frame fluorescent light output lower value</td><td>66</td><td>66</td></tr>
<tr><td>50</td><td>AWB KEIKO DWN</td><td>AWB incoming frame fluorescent light lower value</td><td>59</td><td>59</td></tr>
<tr><td>51</td><td>AWB R TOP LMT</td><td>AWB incoming frame Rcont upper value</td><td>6E</td><td>6E</td></tr>
<tr><td>52</td><td>AWB R DWN LMT</td><td>AWB incoming frame Rcont lower value</td><td>20</td><td>20</td></tr>
<tr><td>53</td><td>AWB B TOP LMT</td><td>AWB incoming frame Bcont upper value</td><td>83</td><td>83</td></tr>
<tr><td>54</td><td>AWB B IN TOP</td><td>AWB incoming frame Bcont</td><td>67</td><td>67</td></tr>
<tr><td>55</td><td>AWB B IN MAX</td><td>AWB incoming frame Bcont</td><td>5C</td><td>5C</td></tr>
<tr><td>56</td><td>AWB B OUT MIN</td><td>AWB incoming frame Bcont</td><td>5C</td><td>5C</td></tr>
<tr><td>57</td><td>AWB B OUT DWN</td><td>AWB incoming frame Bcont</td><td>4A</td><td>4A</td></tr>
<tr><td>58</td><td>AWB B DWN LMT</td><td>AWB incoming frame Bcont lower value</td><td>1B</td><td>1B</td></tr>
<tr><td>59</td><td>AWB LL LMT</td><td>Low luminance intensity limiter</td><td>06</td><td>06</td></tr>
<tr><td>5A</td><td>AWB T M DIVID</td><td>AWB incoming frame upper, middle border value</td><td>5E</td><td>5E</td></tr>
<tr><td>5B</td><td>AWB B M DIVID</td><td>AWB incoming frame middle, lower border value</td><td>39</td><td>39</td></tr>
<tr><td>5C</td><td>AWB DELAY TM</td><td>AWB tracking speed<table><tr><th>Data</th><th>Adjustment mode</th></tr><tr><td>01</td><td>High speed tracking mode</td></tr><tr><td>0A</td><td>Normal</td></tr></table></td><td>0A</td><td>0A</td></tr>
<tr><td>5D</td><td>AWB FAST TM</td><td>AWB initial high speed tracking amount</td><td>40</td><td>40</td></tr>
<tr><td>5E</td><td>AWB OUT HYS OFF</td><td>AWB outdoor hysteresis off difference</td><td>0C</td><td>0C</td></tr>
<tr><td>5F</td><td>AWB OUT B HYS</td><td>AWB outdoor hysteresis amount</td><td>06</td><td>06</td></tr>
<tr><td>60</td><td>AWB MODE</td><td>AWB adjustment mode<table><tr><th>Data</th><th>Adjustment mode</th></tr><tr><td>00</td><td>Normal</td></tr><tr><td>D0</td><td>AWB adjustment mode</td></tr><tr><td>F1</td><td>Sampling display mode</td></tr></table></td><td>00</td><td>00</td></tr>
<tr><td>61</td><td>AE REFL</td><td>Reference value (lower) for AE</td><td>00</td><td>00</td></tr>
<tr><td>62</td><td>AE REFH</td><td>Reference value (upper) for AE</td><td>18</td><td>18</td></tr>
<tr><td>63</td><td>AGC MIN</td><td>AGC MIN value (AGCREF value), IRIS level adjustment</td><td>E3</td><td></td></tr>
<tr><td>64</td><td>AE MIML</td><td>Low luminance intensity side limiter (MAXGAIN), MAX GAIN adjustment</td><td>32</td><td></td></tr>
<tr><td>65</td><td>AE MAXL</td><td>High luminance intensity side limiter (lower)</td><td>80</td><td>80</td></tr>
<tr><td>66</td><td>IRIS OFFSET</td><td>Iris ROM table OPEN side off set</td><td>D0</td><td>D0</td></tr>
<tr><td>67</td><td>AE KEISU</td><td>Correction coefficient during detection weighting</td><td>00</td><td>00</td></tr>
<tr><td>68</td><td>AE FUNCTION</td><td>SW for turning each AE function ON and OFF</td><td>02</td><td>02</td></tr>
<tr><td>69</td><td>BL HOSEIH</td><td>Forcible back light level setting (upper)</td><td>40</td><td>40</td></tr>
<tr><td>6A</td><td>JITEISU DOWN</td><td>Constant during loop response DOWN side</td><td>28</td><td>28</td></tr>
<tr><td>6B</td><td>JITEISU UP</td><td>Constant during loop response UP side</td><td>0D</td><td>0D</td></tr>
<tr><td>6C</td><td>AE KNEE</td><td>KNEE setting value for AE</td><td>FF</td><td>FF</td></tr>
<tr><td>6D</td><td>ORETEN SET</td><td>Variable point due to time constant error amount</td><td>13</td><td>13</td></tr>
</table>

Table 7-2 (3).

Address	Name	Function [ ] Indicate the adjustment voltage output terminal	Adjustment data	
			Initial value	Memo column
6E	OMOMIOUT	Outer frame weighting amount	40	40
6F	AFC WIDE	Coefficient required for the ANF integral loop	03	03
70	AFC GAIN	Loop gain of the flickerless loop	01	01
71	AFC LIMIL	Limiter corresponding to the error rate (Lower)	60	60
72	HIST P KEISU	Histocomp level setting P for counter light determination	20	20
73	HIST H KEISU	Histocomp level setting H for counter light determination	E0	E0
74	HIST L KEISU	Histocomp level setting L for counter light determination	90	90
75	GYKOU JITEISU	Constant during auto back light response	08	08
76	SUBN LIMIT	Limiter for counter light determination	40	40
77	FUZZY RULE1	Correction amount 1 for auto back light	90	90
78	FUZZY RULE2	Correction amount 2 for auto back light	C0	C0
79	FUZZY RULE3	Correction amount 3 for auto back light	B0	B0
7A	FUZZY RULE4	Correction amount 4 for auto back light	A0	A0
7B	FUZZY RULE5	Correction amount 5 for auto back light	70	70
7C	FUZZY RULE6	Correction amount 6 for auto back light	80	80
7D	FUZZY RULE7	Correction amount 7 for auto back light	A0	A0
7E	FUZZY RULE8	Correction amount 8 for auto back light	98	98
7F	FUZZY RULE9	Correction amount 9 for auto back light	90	90
80	FUZZY RULE10	Correction amount 10 for auto back light	78	78
81	IRIS MIN L	Iris limit value for small iris (Lower)	80	80
82	IRIS MIN H	Iris limit value for small iris (Upper)	02	02
83	DELTA SHUTGAIN	Smoothing amount setting	04	04
84	AE WAKUH	Frame data for AE detection (vertical line)	0F	0F
85	AE WAKUV	Frame data for AE detection (horizontal line)	4F	4F
86	WIDE LIMIT	ZOOM limiter WIDE (lower) Flange back adjustment	00	
87	WIDE LIMITH	ZOOM limiter WIDE (upper)	00	
88	TELE LIMIT	ZOOM limiter TELE (lower)	00	
89	TELE SIMITH	ZOOM limiter TELE (upper)	04	
8A	STEP ZERO	Flange back value	80	
8B	STEP ZERO SPAN (VAP ONLY)	Flange back value 2	00	00
8C	ZOOM SPD FAST	Zoom speed (fast)	1C	1C
8D	ZOOM SPD SUPER	Zoom speed (For adjustment)	89	89
8E	ZS INIT SLOW	Zoom speed initial value (slow)	89	89
8F	ZS INIT FAST	Zoom speed initial value (fast)	F0	F0
90	ZMSPD DAMIN	Zoom speed D/A MIN value	3D	3D
91	ZS K	Zoom servo coefficient K	12	12
92	ZS L	Zoom servo coefficient L	02	02
93	ZP HYS	Zoom potential hysteresis	05	05
94	MOTOR ABILITY	Step motor MAX SPEED	08	08
95	AF MD2THL	MODE2 THR	20	20
96	MAXCHG THR	MAX value renewal THR	1A	1A
97	ERR THL	Wobbling width THR	18	18
98	WOB INTV	Wobbling second interval	04	04
99	ERRPOL THR	MODE2 error possible THR	13	13

Table 7-2 (4).

<table>
<tr><th rowspan="2">Address</th><th rowspan="2">Name</th><th rowspan="2">Function
[ ] indicate the adjustment voltage output terminal</th><th colspan="2">Adjustment data</th></tr>
<tr><th>Initial value</th><th>Memo column</th></tr>
<tr><td>9A</td><td>MAXCHK THR</td><td>MAX CHECK THR</td><td>12</td><td>12</td></tr>
<tr><td>9B</td><td>REWOB THR</td><td>Wobbling second THR</td><td>0A</td><td>0A</td></tr>
<tr><td>9C</td><td>MODE2 INOUT</td><td>MODE2 speed switchover</td><td>80</td><td>80</td></tr>
<tr><td>9D</td><td>SMLWD THR</td><td>Small frame THR</td><td>0A</td><td>0A</td></tr>
<tr><td>9E</td><td>ZOOM PULSE LIMIT</td><td>Maximum zoom pulse value</td><td>F0</td><td>F0</td></tr>
<tr><td>9F</td><td>ZOOM RIZE</td><td>Zoom rise minimum speed time</td><td>0A</td><td>0A</td></tr>
<tr><td>A0</td><td>FB CURVEPEAKL</td><td>Constant for flange back adjustment</td><td>00</td><td>00</td></tr>
<tr><td>A1</td><td>FB CURVEPEAKH</td><td>Constant for flange back adjustment</td><td>72</td><td>72</td></tr>
<tr><td>A2</td><td>FB ZOOMSH</td><td>Constant for flange back adjustment</td><td>D2</td><td>D2</td></tr>
<tr><td>A3</td><td>FB ZOOMSH</td><td>Constant for flange back adjustment</td><td>03</td><td>03</td></tr>
<tr><td>A4</td><td>LIMITREST WIDE</td><td>Zoom limiter WIDE side</td><td>10</td><td>10</td></tr>
<tr><td>A5</td><td>LIMITREST TELE</td><td>Zoom limiter TELE side</td><td>10</td><td>10</td></tr>
<tr><td>A6</td><td>FB PEAKTHR</td><td>Constant for flange back adjustment</td><td>80</td><td>80</td></tr>
<tr><td>A7</td><td>FB FOCUSZERO</td><td>Constant for flange back adjustment</td><td>D8</td><td>D8</td></tr>
<tr><td>A8</td><td>DET IRIS ALT</td><td>Iris variation check THR</td><td>02</td><td>02</td></tr>
<tr><td>A9</td><td>DET AGC ALT</td><td>AGC variation check THR</td><td>02</td><td>02</td></tr>
<tr><td>AA</td><td>LIMIT INSURANCE</td><td>Focus limiter insurance value</td><td>05</td><td>05</td></tr>
<tr><td>AB</td><td>FOCUS MODE</td><td>Focus mode
<table>
<tr><th>Data</th><th>Adjustment mode</th></tr>
<tr><td>08</td><td>Zoom, Focus fixed</td></tr>
<tr><td>00</td><td>Normal</td></tr>
</table></td><td>00</td><td>00</td></tr>
<tr><td>AC</td><td>LENS ADJ MOD</td><td>Flange back adjustment mode
<table>
<tr><th>Data</th><th>Adjustment mode</th></tr>
<tr><td>00</td><td>Nomal</td></tr>
<tr><td>01</td><td>Flange back adjustment</td></tr>
</table></td><td>00</td><td>00</td></tr>
<tr><td>AD</td><td>ELENS EMRG</td><td>Lens emergency</td><td>00</td><td>00</td></tr>
<tr><td>AE</td><td>NTSC PAL/H DEF</td><td>DELAY bit=0: NTSC, 1: PAL, bit4-7=CCD correction delay</td><td>25</td><td>25</td></tr>
<tr><td>AF</td><td>FT SW</td><td>DDS display mode switchover
<table>
<tr><th>Data</th><th>DDS display mode</th></tr>
<tr><td>00</td><td>Y sampling display</td></tr>
<tr><td>03</td><td>R–Y, B–Y display</td></tr>
<tr><td>40</td><td>HALL data display</td></tr>
<tr><td>82</td><td>R ratio display</td></tr>
<tr><td>83</td><td>b ratio display</td></tr>
<tr><td>91</td><td>R.B ratio (M) display</td></tr>
<tr><td>B0</td><td>Focus step display</td></tr>
</table></td><td>00</td><td>00</td></tr>
<tr><td>B0</td><td>CORE OTHER</td><td></td><td>10</td><td>10</td></tr>
<tr><td>B1</td><td>CORE YGAIN</td><td>Core field data 0 byte gain</td><td>3A</td><td>3A</td></tr>
<tr><td>B2</td><td></td><td></td><td></td><td></td></tr>
<tr><td>B3</td><td></td><td></td><td></td><td></td></tr>
<tr><td>B4</td><td>ZOOM DROP 1</td><td>F-No. dropping (1) by zoom lens</td><td>00</td><td>00</td></tr>
<tr><td>B5</td><td>ZOOM DROP 2</td><td>F-No. dropping (2) by zoom lens</td><td>95</td><td>95</td></tr>
</table>

Table 7-2 (5).

Address	Name	Function [ ] indicate the adjustment voltage output terminal	Adjustment data	
			Initial value	Memo column
B6				
B7				
B8				
B9				
BA	AWB in B hys	AWB indoor hysteresis amount (B)	04	04
BB	AWB in R hys	AWB indoor hysteresis amount (R)	02	02
BC				
BD				
BE	MF STEP CHNGE	MODE 2 THR coefficient	06	06
BF	ZOOM SPEED SUPER SLOW	Zoom speed (Super slow speed)	08	08
C0	ZOOM INT SUPER SLOW	Zoom speed initial value (Super low speed)	89	89
C1	AF CONTROL FLAG		2C	2C
C2	AE Y THR	Low luminous intensity AE Y THR1	40	40
C3	AE Y MIN	Low luminous intensity AE Y THR2	18	18
C4	MD2 SPD	Focus speed at MODE 2	41	41
C5	AE CHECK	THR for activating re-start up from MODE 7, 8	30	30
C6	LOWCON THR1	THR1 for judging LOW CON at MODE 2	10	10
C7	LOWCON THR2	THR2 for judging LOW CON at MODE 2	20	20
C8~EF		Not used		
F0		Input column of the unit ID No., etc. Not related to unit operations.	FF	
F1			FF	
F2			FF	
F3			FF	
F4			FF	
F5			FF	
F6			FF	
F7			FF	
F8			FF	
F9			FF	
FA			FF	
FB			FF	
FC			FF	
FD			FF	
FE			FF	
FF			FF	

Table 7-2 (6).

7-1-6. 6 Page, 1 Page Address List

The camera adjustment mode can be set by performing the following data settings at page: 6 or page: 1. (These page data can be set temporary, but when the main power (6.3V) is turned off, the original value (normal value) will be returned. Therefore, these adjustment modes can be released very simply by turning the main power off.)

(Example) The camera adjustment mode (window OFF) is set by setting data: 01 to page: 6, address: 00. The F page write protect will also be released.

1. Page 6

Address	Adjustment Mode	Data	Function
00	Camera adjustment mode	01 10 11	Camera adjustment mode (window OFF), F page write protect released Normal Camera adjustment mode (window ON), F page write protect released
01	Camera adjustment switch **Note:** To set this address adjustment mode, it is necessary to press the PAUSE button of the adjusting remote control unit after setting the data.	00 01 03 05 07 09 0B 0D 0F 11 13 15 1F	Normal IRIS OPEN, AGC HOLD IRIS CLOSE1, AGC HOLD IRIS CLOSE2, AGC MIN IRIS CLOSE3, AGC MAX ND0.5 SHUTTER (PAL=1/160, NTSC=1/190) ND0.8 SHUTTER (PAL=1/320, NTSC=1/380) AWB PRESET1: 3200K PRESET DATA take in WB 3200K PRESET: Indoor white balance mode AWB PRESET2: 3200K PRESET DATA take in ZOOM HUNTING1 ZOOM SPDSLOW ZOOM HUNTING2 ZOOM SPDFAST EEPROM PRE WRITE: Page F initial data write
05	Shutter mode	00 15	NTSC=1/60, PAL=1/50 NTSC=1/2000, PAL=1/2000
08	ZOOM speed SLOW/FAST	00 01 02 03	Normal ZOOM speed SLOW (10 second) ZOOM speed FAST (3.5 second) ZOOM speed SLOW (10 second)
09 ★	COMPLEATED FLAG	00 01	Camera Adjustment not completed Camera adjustment completed
11 ★	ROM VERSION	01 02 04	Camera micro processor ver1 Camera micro processor ver2, ver3 Camera micro processor ver4

Addresses with ★ are exclusively for reading.

Table 7-3.

2. Page 1

Address	Adjustment Mode	Data	Function
E6	VH address L		Title horizontal/vertical position (L)
E7	VH address H		Title horizontal/vertical position (H)

Table 7-4.

7-1-7. Adjustment Connector

Most of the measuring points for the camera section adjustment are concentrated on CN701 of the CS-35 board. Connect the oscilloscope and etc. via the measuring pin (J-6082-139-A). The following table lists the terminal numbers and the signal names of CN701.

Terminal Number	Signal Name	Terminal Number	Signal Name
1	EVER 5V	2	NC
3	ZOOM SW	4	CAM SI
5	$\overline{\text{CS ROM}}$	6	CAM SO
7	$\overline{\text{CS OPD}}$	8	$\overline{\text{CAM SCK}}$
9	$\overline{\text{CS CORE}}$	10	GND
11	IRIS OUT	12	NC
13	V SUB CHK	14	C OUT
15	PG CONT	16	GND
17	NC	18	Y OUT

Table 7-5.

7-1-8. Data Processing

The calculation of the DDS display and the adjusting remote control unit display data (hexadecimal notation) are required for obtaining the adjustment data of some adjustment items. In this case, after converting the hexadecimal notation to decimal notation, calculate and convert the result to hexadecimal notation, and use it as the adjustment data. Table 7-6. indicates the hexadecimal notation-the decimal notation calculation table.

Hexadecimal notation-Decimal notation

②

The lower digits of the hexadecimal notation The upper digits of the hexadecimal notation	0	1	2	3	4	5	6	7	8	9	A (A)	B (b)	C (c)	D (d)	E (E)	F (F)
0	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
1	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31
2	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47
3	48	49	50	51	52	53	54	55	56	57	58	59	60	61	62	63
4	64	65	66	67	68	69	70	71	72	73	74	75	76	77	78	79
5	80	80	82	83	84	85	86	87	88	89	90	91	92	93	94	95
6	96	97	98	99	100	101	102	103	104	105	106	107	108	109	110	111
7	112	113	114	115	116	117	118	119	120	121	122	123	124	125	126	127
8	128	129	130	131	132	133	134	135	136	137	138	139	140	141	142	143
9	144	145	146	147	148	149	150	151	152	153	154	155	156	157	158	159
A (A)	160	161	162	163	164	165	166	167	168	169	170	171	172	173	174	175
① → **B (b)**	176	177	178	179	180	180	182	183	184	185	186	187	188	189	190	191
C (c)	192	193	194	195	196	197	198	199	200	201	202	203	204	205	206	207
D (d)	208	209	210	211	212	213	214	215	216	217	218	219	220	221	222	223
E (E)	224	225	226	227	228	229	230	231	232	233	234	235	236	237	238	239
F (F)	240	241	242	243	244	245	246	247	248	249	250	251	252	253	254	255

Note: ( ) indicate the adjusting remote control unit display.

(Example) In the case that the DDS display and the adjusting remote control unit display are BD (b d).
As the upper digit of the hexadecimal notation is B (b), and the lower digit is D (d), the intersection "189" of the ① and ② in the above table is the decimal notation to be calculated.

Table 7-6.

7-2. CAMERA SYSTEM ADJUSTMENT

1. Power Supply Voltage Check (PS-300 board)

Subject	Option
Measuring instrument	Digital voltmeter
D5V check	
Measurement point	Pins ⑰ and ⑱ of CN950
Specified value	4.98 ± 0.15 Vdc
D4V check	
Measurement point	Pins ⑮ and ⑯ of CN950
Specified value	4.03 ± 0.15 Vdc
CAM 5V check	
Measurement point	Pins ⑬ and ⑭ of CN950
Specified value	4.90 ± 0.15 Vdc
15V check	
Measurement point	Pin ⑪ of CN950
Specified value	15.04 ± 0.4 Vdc
–9V check	
Measurement point	Pin ⑫ of CN950
Specified value	–8.5 ± 0.4 Vdc

Checking method:

1) Check that each power supply voltage satisfies the specified value.

2. Page F Data Initialization

Note: It is necessary to perform all adjustments of the camera section from the beginning again if the data of page F has been initialized.

Initializing method:

1) Release the protect.
   Page: 6, address: 00, data: 01.
2) Check that the data of page: 6, address: 09 is 00.
   (Display indicating that page F data can be initialized)
3) Set data: 21 to page: 6, address: 01, and press the PAUSE button of the adjusting remote control unit.
   (Page F data initialization execution.
   The data of all addresses of page F will be initialized.)
4) Check that the data of page: 6, address: 09 is 01.
   (Displays that the initialization of page F data has been completed)
5) Set data: 00 to page: 6, address: 01. and press the PAUSE button of the adjusting remote control unit.
   (Releases the page F data initialization mode)
6) After performing "Page F data modification", perform all the adjustments of the camera section (page F).

3. Page F Data Modification

The data (initial data) that is automatically written on page F after the initialization of the page F data is different from the initial data for adjustment. Change the data by manual input, and arrange it.

Note: When changing the data, to write the data to the non-volatile memory, press the PAUSE button of the adjusting remote control unit every time the new data is set.

Address	Data
00 (ID)	2D
11 (CORE EFECT)	A0
14 (CORE BURST LEVEL)	38
15 (CORE CHROMA DLY)	03
16 (CORE Y SETUP)	03
5C (AWB DELAY TM)	0A
68 (AE FUNCTION)	02
6A (JITEISU DOWN)	28
6B (JITEISU UP)	0D
8C (ZOOM SPD FAST)	1C
8D (ZOOM SPD SUPER)	89
8E (ZS INIT SLOW)	89
8F (ZS INIT FAST)	F0
94 (ZOOM SPD SLOW)	08
9E (ZOOM PULSE LIMIT)	F0
AE (NTSC PAL/H DEF DELAY)	25
B0 (CORE OTHER)	10
B1 (CORE Y GAIN)	3A
BF (ZOOM SPEED SUPER SLOW)	08
C0 (ZOOM INT SUPER SLOW)	89

[Distinguishing the Camera Micro Computer (IC709) Versions]

The camera micro computer version can be distinguished by looking at the part name of the camera micro processor or the data of page: 6, address: 11.

Version	Part Name	Page: 6 Address: 11
Ver.5	CXP80624-299Q	05

4. 28 MHz Original Oscillation Adjustment (CS-35 board)

Subject	Not required
Measurement Point	CL821 (pin (57) of IC801)
Measuring Instrument	Frequency counter
Adjusting Element	CT801
Specified Value	14187500 ± 71 Hz

Adjusting method:

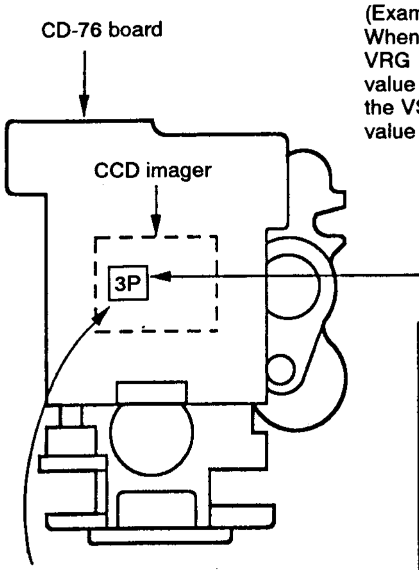
1) Use CT801 to adjust the oscillation frequency to 14187500 ± 71 Hz.

5. V SUB Adjustment (CS-35 board)

Subject	Not required
Measurement Point	Pin ⑬ of CN701 (V SUB CHK)
Measuring Instrument	Digital voltmeter
Adjustment Page	F
Adjustment Address	04 (V SUB)
Specified Value	(Imager display voltage) ± 0.1 Vdc

Adjusting method:

1) Release the protect.
   Page: 6, address: 00, data: 01
2) Change the data of page: F, address: 04, and adjust the voltage of pin ⑬ of CN701 to (imager display voltage) ± 0.1 Vdc.
3) Press the PAUSE button of the adjusting remote control unit.



(Example)
When the display is 3P, the VRG voltage specified value =2.0 ± 0.1 Vdc, and the VSUB voltage specified value =13.5 ± 0.1 Vdc.

VRG voltage code address

Code address	Voltage (Vdc)
1	1.0
2	1.5
3	2.0
4	2.5
5	3.0
6	3.5
7	4.0

VSUB voltage code address

Code address	Voltage (Vdc)
E	9.0
F	9.5
G	10.0
H	10.5
J	11.0
K	11.5
L	12.0
M	12.5
N	13.0
P	13.5
Q	14.0
R	14.5
S	15.0
T	15.5
U	16.0
V	16.5
W	17.0
X	17.5
Y	18.0
Z	18.5

Fig. 7-7.

6. VRG Adjustment (CS-35 board)

Subject	Not required
Measurement Point	Pin ⑮ of CN701 (PG CONT)
Measuring Instrument	Digital voltmeter
Adjustment Page	F
Adjustment Address	05 (VRG)
Specified Value	(Imager display voltage) ± 0.1 Vdc

Adjusting method:

1) Release the protect.
   Page: 6, address: 00, data: 01
2) Change the data of page: F, address: 05, and adjust the voltage of pin ⑮ of CN701 to (imager display voltage) ± 0.1 Vdc.
3) Press the PAUSE button of the adjusting remote control unit.

7. CCD Imager Correction Data Write

Subject	Not required
Adjustment Page	F
Adjustment	1D to 2C (CCD-DEFECT)

Perform CCD imager correction data write in the following cases.

1. When the CCD imager has been replaced
2. The ocassion of exchaning a camera micro processor or EEPROM (IC712).
3. When the page F data has been initialized

In the case of 1, as the correction data is not required for the CCD imager for repair, adjust all data of addresses 1D to 2C to "00".

In the case of 2 and 3, write the correction data attached to the shield case of PS-300 board to addresses 1D to 2C.

If the correction data are not attached, adjust all data of addresses 1D to 2C to "00".

Adjusting method:

1) Release the protect.
   Page: 6, address: 00, data: 01
2) Write the correction data to page: F, addresses: 1D to 2C.
   Note: To perform write to the non-volatile memory, press the PAUSE button of the adjusting remote control unit.

Processing after completing adjustments

1) If the CCD imager has been replaced, remove the old correction data label attached on the shield case (UPPER) of PS-300 board.

8. HALL Adjustment

Subject	Not required
Measurement Point	DDS display of EVF or monitor TV
Measuring Instrument	
Adjustment Page	F
Adjustment Address	08 (HALL GAIN) 09 (HALL OFFSET)
Specified Value	31 TO 35 during IRIS OPEN B1 to B5 during IRIS CLOSE

Adjusting method:

1) Release the protect.
   Page: 6, address: 00, data: 01
2) Set data: 40 to page: F, address: AF, and press the PAUSE button of the adjusting remote control unit.
   (HALL output display mode setting)
3) Set data: 03 to page: 6, address: 01, and press the PAUSE button of the adjusting remote control unit.
   (IRIS CLOSE mode setting)
4) Set data: 40 to page: F, address: 08, and press the PAUSE button of the adjusting remote control unit.
5) Read the DDS display data (the bottom two digits of the display data at the bottom right of the EVF or the monitor TV display), and set to W_2.
6) Set data: 30 to page: F, address: 08, and press the PAUSE button of the adjusting remote control unit.
7) Read the DDS display data, and set to W_1.
8) Set data: 01 to page: 6, address: 01, and press the PAUSE button of the adjusting remote control unit.
   (IRIS OPEN mode setting)
9) Read the DDS display data, and set to K_1.
10) Set data: 40 to page: F, address: 08, and press the PAUSE button.
11) Read the DDS display data, and set to K_2.
12) Convert W_1, W_2, K_1, K_2 to decimal notation, and obtain W_1', W_2', K_1', K_2'. (Refer to Table 7-6. "Hexadecimal notation-decimal notation conversion table".)
13) Calculate X_1' using the following equations (decimal notation calculation).
    $A'=W_2'+K_1'-W_1'-K_2'$ ··························Equation 1
    $B'=W_1'-K_1'$ ·······································Equation 2
    $X_1'=\frac{2048+(48\times A')-(16\times B')}{A'}$ ················Equation 3
14) Convert X_1' to hexadecimal notation, and obtain X_1.
    (Round off to one decimal place)
15) Set data: X_1 to page: F, address: 08, and press the PAUSE button of the adjusting remote control unit.
16) Change the data of page: F, address: 09, and adjust the DDS display data to "33".
17) Press the PAUSE button of the adjusting remote control unit.
18) Set data: 03 to page: 6, address: 01, and press the PAUSE button of the adjusting remote control unit.
    (IRIS CLOSE mode setting)
19) Read the DDS display data, and set to W_0. If W_0 lies within the "B1" to "B5" range, perform "Processing after completing adjustments". If it lies outside the range, perform the following adjustments.
20) Convert W_0 to decimal notation, and obtain W_0'.
21) Calculate X_2' using the following equations (decimal notation calculation).
    $C'=W_0'-B'-51$ ··································Equation 4
    $X_2'=\frac{(128-B')\times(X_1'-48)+48\times C'}{C'}$ ···········Equation 5
    (X_1' and B' are values obtained from equations 2 and3)
22) Convert X_2' to hexadecimal notation and obtain X_2.
    (Round off to one decimal place)
23) Set data X_2 to page: F, address: 08, and press the PAUSE button of the adjusting remote control unit.
24) Change the data of page: F, address: 09, and adjust the DDS display data to "B3".
25) Press the PAUSE button of the adjusting remote control unit.
26) Set data: 01 to page: 6, address: 01, and press the PAUSE button of the adjusting remote control unit.
    (IRIS OPEN mode setting)
27) Check that the DDS display data lies within the "31" to "35" range.

Processing after Completing Adjustments

1) Set data: 00 to page: 6, address: 01, and press the PAUSE button of the adjusting remote control unit.
   (IRIS NORMAL mode setting)

9. Flange Back Adjustment

Subject	Chart for flange back adjustment (1m from the front side of the lens Luminance: 300 ± 50 lux)
Measurement Point	Check the operations on the TV monitor
Measuring Instrument	
Adjustment Page	F
Adjustment Address	8A (STEP ZERO), 86 (WIDE LIMIT), 87 (WIDE LIMIT H), 88 (TELE LIMIT), 89 (TELE LIMIT H)

Adjusting method:

1) Turn the auto focus off.
2) Adjust the focus using the focus ring.
3) Check that the flange back adjustment chart center and the exposure display center coincide at both zoom lens TELE end and WIDE end.
4) Release the protect.
   Page: 6, address: 00, data: 01
5) Check that the data of page: 6, address: 09 is 00.
   (Flange back adjustment possible display)
6) Check that the page: F, address: 86 to 8B data is at the initial value. (Refer to Table 7-2. "Page F address list")
7) Set data: 01 to page: F, address: AC.
   (This causes automatic adjustment to be performed. Adjustments are performed at the zoom lens TELE end first, and then at the WIDE end. The adjustment data is automatically input to page: F, addresses: 86 to 8A.)
8) Check that the data of page: 6, address: 09 is 01.
   (Display indicating flange back adjustment completion)

Processing after completing adjustments

1) Set data: 00 to page: F, address: AC.
2) Turn off the main power supply (6.3V).

10. Flange Back Check

Subject	Siemens star (1m from the front of the lens)
Measurement Point	DDS display of EVF or TV monitor
Measuring Instrument	
Specified Value	$D_2=D_1 \pm 5$ $D_4=D_3 \pm 5$

Checking method:

1) Set data: 11 to page: 6, address: 00. (Camera adjustment (Window ON) mode)
2) Set data: B0 to page: F, address: AF. (Focus step display mode)
3) Place the Siemens star 1m from the front of the lens.
4) To open the IRIS, decrease the luminous intensity to the Siemens star up to a point before noise appears on the image.
5) Turn off the auto-focus.

- Checking the flange back at the center point of the zoom.

6) Shoot the Siemens star with the zoom TELE end.
7) Rotate the focus ring, and adjust the focus.
8) Adjust to the center point of the zoom.
   (Adjust to the center point by viewing the EVF zoom position.)
9) Read the focus step value (4 digits) displayed on the TV monitor, and take the value as D_1.
10) Rotate the focus ring, and adjust the focus.
    Read the focus step value here, and take the value as D_2.
11) Check that $D_2=D_1 \pm 5$.

- Checking the flange back at the zoom WIDE end.

12) Shoot the Siemens star at the zoom TELE end.
13) Rotate the focus ring, and adjust the focus.
14) Adjust to the zoom WIDE edge.
15) Read the focus step value displayed on the TV monitor, and take the value as D_3.
16) Rotate the focus ring, and adjust the focus.
    Read the focus step value here, and adjust to D_4.
17) Check that $D_4=D_3 \pm 5$.

Process after checking

1) Set data: 00 to page: F, address: AF, and press the PAUSE button of the adjusting remote control unit.

11. SYNC Level Adjustment (CS-35 board)

Subject	Not required
Measurement Point	Pin ⑱ of CN701 (Y OUT)
Measuring Instrument	Oscilloscope
Adjustment Page	F
Adjustment Address	06 (VREF-Y)
Specified Value	A=150 ± 5 mV

Adjusting method:

1) Release the protect.
   Page: 6, address: 00, data: 01
2) Set data: 05 to page: 6, address: 01, and press the PAUSE button of the adjusting remote control unit.
   (IRIS CLOSE mode setting)
3) Change the data of page: F, address: 06, and adjust so that the SYNC level (A) becomes the specified value.
4) Press the PAUSE button of the adjusting remote control unit.

Processing after completing adjustments

1) Set data: 00 to page: 6, address: 01, and press the PAUSE button of the adjusting remote control unit.
   (Release of IRIS CLOSE mode)

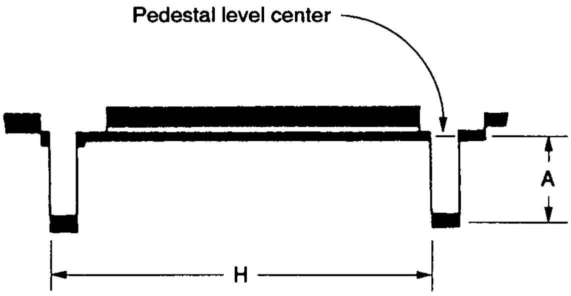


Fig. 7-8.

12. BURST Level Adjustment (CS-35 board)

Subject	Not required
Measurement Point	Pin ⑭ of CN701 (C OUT)
Measuring Instrument	Oscilloscope
Adjustment Page	F
Adjustment Address	07 (VREF-C)
Specified Value	A=150 ± 5 mVp-p

Adjusting method:

1) Release the protect.
   Page: 6, address: 00, data: 01
2) Set data: 05 to page: 6, address: 01, and press the PAUSE button of the adjusting remote control unit.
   (IRIS CLOSE mode setting)
3) Change the data of page: F, address: 07, and adjust so that the burst level (A) becomes the specified value.
4) Press the PAUSE button of the adjusting remote control unit.

Processing after completing adjustments

1) Set data: 00 to page: 6, address: 01, and press the PAUSE button of the adjusting remote control unit.
   (Release of IRIS CLOSE mode)

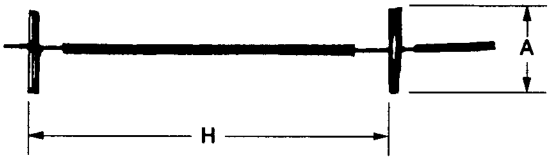


Fig. 7-9.

13. A/D Offset Adjustment

Subject	Not required
Measurement Point	DDS display on the EVF or the TV monitor
Measuring Instrument	
Adjustment Page	F
Adjustment Address	0C (AD REF)
Specified Value	40 to 41

Adjusting method:

1) Release the protect.
   Page: 6, address: 00, data: 01
2) Set data: 05 to page: 6, address: 01, and press the PAUSE button of the adjusting remote control unit.
   (IRIS CLOSE AGC MIN mode setting)
3) Set data: 00 to page: F, address: AF, and press the PAUSE button of the adjusting remote control unit.
   (Y sampling output mode setting)
4) Set data: 00 to page: F, address: 16, and press the PAUSE button of the adjusting remote control unit.
   (Sets the SET UP level to 0)
5) Set data: 35 to page: 1, address: E6.
   (Setting 1 of the sampling position)
6) Set data: 6D to page: 1, address: E7.
   (Setting 2 of the sampling position)
7) Change the data of page: F, address: 0C, and adjust the average value of the DDS display (the bottom two digits of the display data at the bottom right of the EVF or the TV monitor display) to 40 to 41.
   (Set the data of address 0C to the maximum value satisfying the specification.)
8) Press the PAUSE button of the adjusting remote control unit.

Processing after completing adjustments

1) Set data: 03 to page: F, address: 16, and press the PAUSE button of the adjusting remote control unit.
   (Returns the SET UP level to the normal level.)
2) Turn the main power supply (6.3V) off.

14. Carrier Balance Adjustment

Subject	Not required
Measurement Point	Video output terminal
Measuring Instrument	Vectorscope
Adjustment Page	F
Adjustment Address	03 (CS SL)
Specified Value	The center of the black luminance point should lie within the 1 φ circle whose center is the principle point.

Adjusting method:

1) Release the protect.
   Page: 6, address: 00, data: 01.
2) Set data: 07 to page: 6, address: 01, and press the PAUSE button of the adjusting remote control unit.
   (IRIS CLOSE, AGC MAX mode setting)
3) Change the data of page: F, address: 03, and adjust so that the center of the black luminance point coincides with the principle point.
4) Press the PAUSE button of the adjusting remote control unit.

Processing after completing adjustments

1) Set data: 00 to page: 6, address: 01, and press the PAUSE button of the adjusting remote control unit.
   (IRIS NORMAL mode setting)

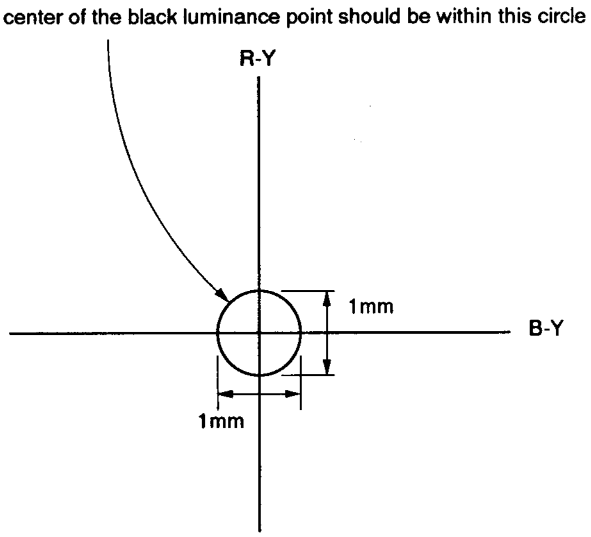

The center of the black luminance point should be within this circle
R-Y
1mm
B-Y
1mm

Fig. 7-10.

15. Picture Frame Setting

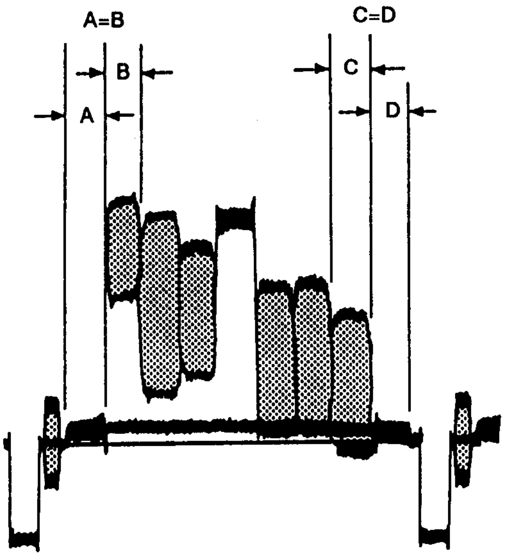
Subject	Color bar chart standard picture frame
Measurement Point	Video output terminal
Measuring Instrument	Oscilloscope and TV monitor.
Specified Value	A=B, C=D, t=0 ± 0.1 msec

Setting method:

1) Turn the auto focus off.
2) Adjust the focus using the focus ring.
3) Adjust the zoom and the camera direction, and set to the specified position.
4) Mark the position of the picture frame on the monitor display, and adjust the picture frame to this position in following adjustments using "color bar chart standard picture frame" and "white pattern standard picture frame".

Check on the oscilloscope

1. horizontal period



2. Vertical period

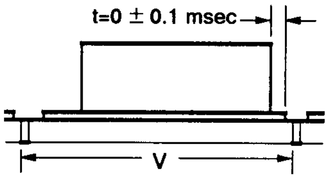


Fig. 7-11.

Check on the TV monitor

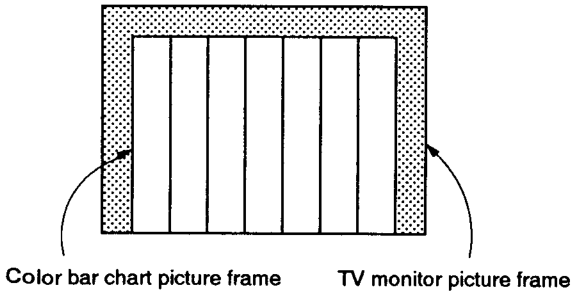


Fig. 7-12.

16. IRIS Level Adjustment (CS-35 board)

Subject	Color bar standard picture frame
Measurement Point	Pin ⑪ of CN701 (IRIS OUT)
Measuring Instrument	Oscilloscope
Adjustment Page	F
Adjustment Address	63 (AGC MIN)
Specified Value	A=220 ± 5 mV

Adjusting method:

1) Release the protect.
   Page: 6, address: 00, data: 01
2) Change the data of page: F, address: 63, and adjust so that the IRIS OUT signal level (A) becomes the specified value.
3) Press the PAUSE button of the adjusting remote control unit.

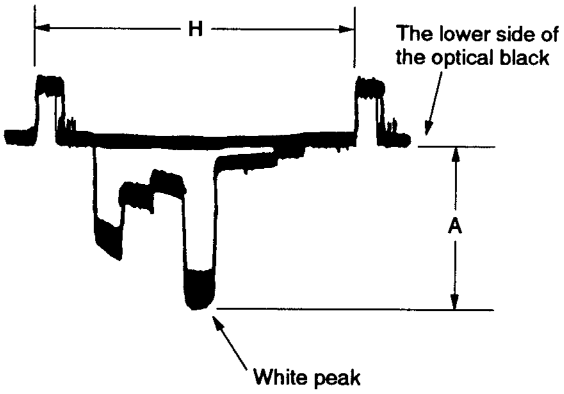


Fig. 7-13.

17. MAX GAIN Adjustment (CS-35 board)

Subject	Color bar standard picture frame
Filter	ND filter 1.0 (2 sheets) and 0.4 (1 sheet), 0.1 (1 sheet)
Measurement Point	Pin ⑱ of CN701 (CAM Y)
Measuring Instrument	Oscilloscope
Adjustment Page	F
Adjustment Address	64 (AE MIN L)
Specified Value	A=230 ± 5 mV

Adjusting method:

1) Place the ND filter 2.5 (1.0+1.0+0.4+0.1) on the lens.
2) Release the protect.
   Page: 6, address: 00, data: 01
2) Change the data of page: F, address: 64, and adjust so that the CAM Y signal level (A) becomes the specified value.
4) Press the PAUSE button of the adjusting remote control unit.

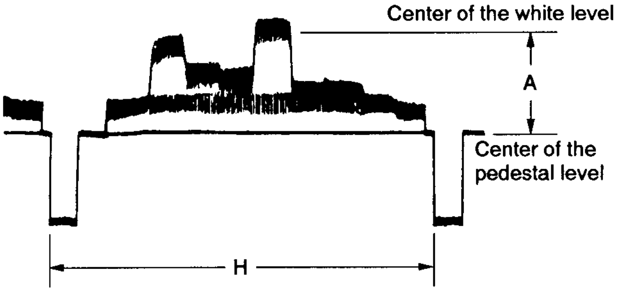


Fig. 7-14.

18. IRIS IN/OUT Adjustment

Subject	White pattern standard picture frame
Measurement Point	DDS display of the EVF or TV monitor
Measuring Instrument	
Adjustment Page	F
Adjustment Address	39 (AWB IRIS IN) 3A (AWB IRIS OUT)

Adjusting method:

1) Set data: 11 to page: 6, address: 00.
   (Camera adjustment mode (Window ON) setting)
2) Set data: 40 to page: F, address: AF, and press the PAUSE button of the adjusting remote control unit.
   (HALL data display)
3) Set data: 0B to page: 6, address: 01, and press the PAUSE button of the adjusting remote control unit.
   (ND0.8 shutter mode setting)
4) Read the DDS display data (the bottom two digits of the display data at the bottom right of the EVF or the TV monitor), and set to D39.
5) Set data: D39 to page: F, address: 39, and press the PAUSE button of the adjusting remote control unit.
6) Set data: 09 to page 6, address: 01, and press the PAUSE button of the adjusting remote control unit.
   (ND0.5 shutter mode setting)
7) Read the DDS display data and set to D3A.
8) Set data: D3A to page: F, address: 3A, and press the PAUSE button of the adjusting remote control unit.

Processing after completing adjustments

1) Set data: 00 to page: 6, address: 01, and press the PAUSE button of the adjusting remote control unit.
   (Release of the ND0.8 shutter mode)

19. Pre-white Balance Adjustment

Subject	White pattern standard picture frame
Measurement Point	Video output terminal
Measuring Instrument	Vectorscope
Adjustment Page	F
Adjustment Address	33 (R CONT REF), 34 (B CONT REF)
Specified Value	The center of the white luminance point should lie within the circle with a diameter of 1mm and whose center is the principle point

Adjusting method:

1) Set data: 0F to page: 6, address: 01, and press the PAUSE button of the adjusting remote control unit.
   (WB 3200K preset mode setting)
2) Set data: 11 to page: 6, address: 00.
   (Camera adjustment mode (Window ON) setting)
3) Change the data of addresses:33 and 34 of page: F alternately, and coincide the white luminance point to the principle point.
   Note: Be sure to press the PAUSE button of the adjusting remote control unit before changing the addresses.
   If not, the new data will not written to the memory.
4) Press the PAUSE button of the adjusting remote control unit.

Processing after completing adjustments

1) Set data: 00 to page: 6, address: 01, and press the PAUSE button of the adjusting remote control unit.
   (Release of the preset mode)
2) Set data: 10 to page: 6, address: 00.
   (Protect mode setting)

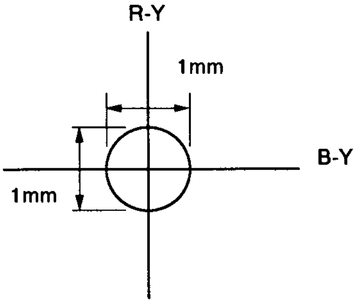


Fig. 7-15.

20. Color Reproduction Adjustment

Subject	Color bar chart standard picture frame
Measurement Point	Video output terminal
Measuring Instrument	Vectorscope
Adjustment Page	F
Adjustment Address	18 (CORE B-Y GAIN), 19 (CORE R-Y GAIN), 1A (CORE R-Y HUE), 1B (CORE B-Y HUE)
Specified Value	All color luminance points should settle within each color reproduction frame.

Adjusting method:

1) Set data: 0F to page: 6, address: 01, and press the PAUSE button of the adjusting remote control unit.
   (Indoor white balance mode setting)
2) Set data: 01 to page: 6, address: 00.
   (Camera adjustment mode (Window OFF) setting)
3) Adjust the GAIN and PHASE of the vectorscope, and adjust the burst luminance point to the burst position of the color reproduction frame.
4) Change the data of addresses 18 to 1B of page: F, and settle each color luminance point in each color reproduction frame.
   Note: Be sure to press the PAUSE button of the adjusting remote control unit before changing the addresses.
   If not, the new data will not be written to the memory.
5) Press the PAUSE button of the adjusting remote control unit.

Processing after completing adjustments

1) Set data: 00 to page: 6, address: 01.
   (Release of the adjustment mode)
2) Set data: 10 to page: 6, address: 00.
   (Protect mode setting)

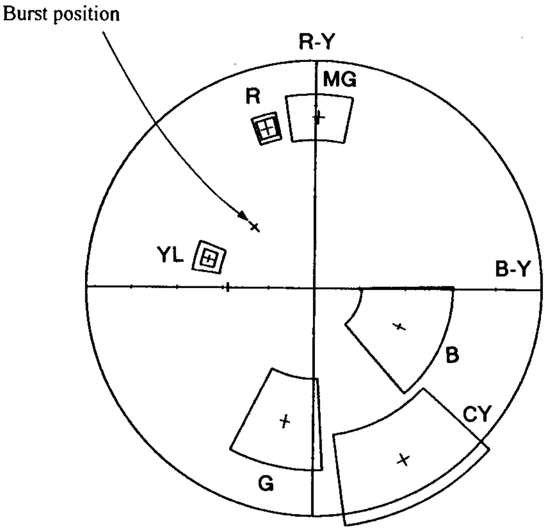


Fig. 7-16.

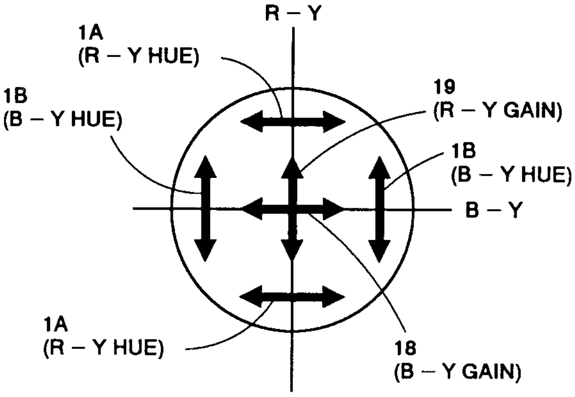


Fig. 7-17. Direction of the Movements of the Adjustment Address and Luminance Point

21. Auto White Balance Preset Adjustment

Subject	White pattern standard picture frame
Adjustment Page	F
Adjustment Address	2D (R REF L), 2E (R REF H), 2F (G REF L), 30 (G REF H), 31 (B REF L), 32 (B REF H)

Adjusting method:

1) Turn the power of the unit OFF/ON.
2) Check that the data of page: 6, address: 09 is 00.
   (Auto white balance preset adjustment possible display)
3) Set data: 11 to page: 6, address: 00.
   (Camera adjustment mode (Window ON) setting)
5) Set data: 11 to page: 6, address: 01, and press the PAUSE button of the adjusting remote control unit.
   (3200K preset data take in preparation mode)
6) Set data: 0D to page: 6, address: 01, and press the PAUSE button of the adjusting remote control unit.
   (When the 3200K preset data is taken in, the data will be automatically input to addresses 2D to 32 of page F.)
7) Check that the data of page: 6, address: 09 is 01.
   (Auto white balance preset adjustment completion display)

Processing after completing adjustments

1) Set data: 00 to page: 6, address: 01, and press the PAUSE button of the adjusting remote control unit.
   (Release of the auto white balance preset mode)
2) Set data: 10 to page: 6, address: 00.
   (Release of camera adjustment mode)

22. Auto White Balance Adjustment

Subject	White pattern standard picture frame
Filter	Filter C14 for color temperature correction
Measurement Point	Check with the DDS display on the EVF or TV monitor
Measuring Instrument	
Adjustment Page	F
Adjustment Address	35 (AWB NORM R) 36 (AWB NORM B)
Specified Value	R ratio 2980 ± 40 B ratio 5C80 ± 40

Note: Check that "Auto white balance preset adjustment" has been completed.

Adjusting method:

1) Set data: 11 to page: 6, address: 00.
   (Camera adjustment mode (Window ON) setting)
2) Set data: D0 to page: F, address: 60, and press the PAUSE button of the adjusting remote control unit.
   (Auto white balance adjustment mode setting)
3) Set data: 82 to page: F, address: AF.
   (R ratio display mode setting)
4) Change the data of page: F, address: 35, and adjust the average value of the DDS display data (the display data at the bottom right of the EVF or the TV monitor) to 2980 ± 40.
5) Press the PAUSE button of the adjusting remote control unit.
6) Set data: 83 to page: F, address: AF.
   (B ratio display mode setting)
7) Change the data of page: F, address: 36, and adjust the average value of the DDS display data to 5C80 ± 40.
8) Press the PAUSE button of the adjusting remote control unit.

Processing after completing adjustments

1) Set data: 00 to page: F, address: 60, and press the PAUSE button of the adjusting remote control unit.
   (Release of the white balance adjustment mode)
2) Set data: 10 to page: 6, address: 00.
   (Release of camera adjustment mode)

23. White Balance Check

Subject	White pattern standard picture frame
Filter	Filter C14 for color temperature correction ND filter 1.0 and 0.3
Measurement Point	Video output terminal
Measuring Instrument	Vectorscope
Specified Value	Fig. 7-18. A to C

Checking method:

1) Check that the lens is not covered with either filter.
2) Set data: 11 to page: 6, address: 00.
(Camera adjustment mode (Window ON) setting)
3) Set data: 0F to page: 6, address: 01, and press the PAUSE button of the adjusting remote control unit.
(Indoor white balance mode setting)
4) Check that the center of the white luminance point is within the circle shown in Fig. 7-18.A.
(Indoor white balance check)
5) Set data: 00 to page: 6, address: 01, and press the PAUSE button of the adjusting remote control unit.
(Auto white balance mode setting)
6) Set data: 01 to page: F, address: 5C, and press the PAUSE button of the adjusting remote control unit.
(Auto white balance high speed tracking mode setting)
7) Set data: 91 to page: F, address: AF, and press the PAUSE button of the adjusting remote control unit.
(R, B ratio (M) display mode setting)
8) Check that the top 2 digits and the bottom 2 digits of the DDS display are 3D to 43.
9) Check that the center of the white luminance point is within the circle shown in Fig. 7-18. A.
10) Place the C14 filter on the lens.
11) Check that the center of the white luminance point settles in the circle shown in Fig. 7-18. B.
(Auto white balance outdoor mode check)
12) Remove the C14 filter, and place the ND filter 1.3 (1.0+0.3) on the lens.
13) Check that the center of the white luminance point settles in the circle shown in Fig. 7-18. C.
(Auto white balance outdoor mode check)

Processing after completing adjustments

1) Set data: 0A to page: F, address: 5C, and press the PAUSE button of the adjusting remote control unit.
(Release of the auto white balance fast tracking mode)
2) Set data: 00 to page: F, address: AF, and press the PAUSE button of the adjusting remote control unit.
(Release of the R, B ratio (M) display mode)
3) Set data: 10 to page: 6, address: 00.
(Release of camera adjustment mode)

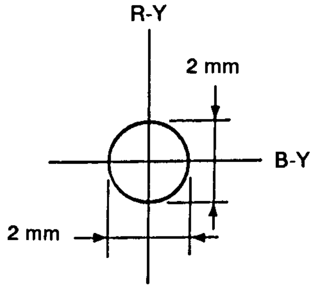


Fig. 7-18. A

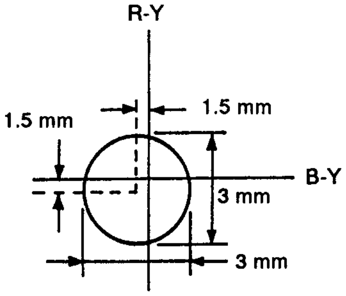


Fig. 7-18. B

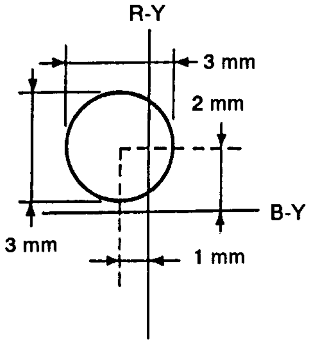


Fig. 7-18. C

24. Linear Matrix Adjustment

Subject	Color bar standard picture frame
Filter	Filter C14 for color temperature correction
Measurement Point	DDS display on the EVF or TV monitor
Measuring Instrument	
Adjustment Page	F
Adjustment Address	3D (DMAT HUE) 3E (DMAT GAIN)

Note 1: Check that position that was set in the color bar chart picture frame "15. Picture Frame Setting" is maintained, before beginning adjustments.

Adjusting method:

1) Remove the filter C14 for color temperature correction.
2) Release the protect.
   Page: 6, address: 00, data: 01
3) Color bar data sampling mode setting
   1. Check that the data of page: 6, address: 01 is 00.
   2. Set data: F1 to page: F, address: 60, and press the PAUSE button of the adjusting remote control unit.
   3. Set data: 2E to page: F, address: 14, and press the PAUSE button of the adjusting remote control unit.
   (Check that the colors on the monitor display at the color modulation stop mode have disappeared)
4) Specifying the Yellow position
   1. Set data: C9 to page: 1, address: E6.
   2. Set data: B6 to page: 1, address: E7.
5) Set data: 03 to page: F, address: AF, and press the PAUSE button of the adjusting remote control unit.
   (R–Y•B–Y data display mode setting)
6) Read the average value of the DDS display R–Y data (Note 2), and set to Y_1.
7) Specifying the Red position
   1. Set data: 59 to page: 1, address: E6.
   2. Set data: 6D to page: 1, address: E7.
8) Read the average value of the DDS display B–Y data (Note 2), and set to R_1.
9) Place the filter C14 for color temperature correction on the lens. (Ensure that the picture frame of the chart does not shift at this time.)
10) Specifying the yellow position.
    1. Set data: C9 to page: 1, address: E6.
    2. Set data: 8F to page: 1, address: E7.
11) Read the average value of the DDS display R–Y data (Note 2), and set to Y_2.
12) Convert Y_1, R_1, Y_2 to decimal notation to obtain Y_1', R_1' and Y_2'.
    (Refer to Table 7-6. "Hexadecimal notation-decimal notation conversion table")
13) Calculate X_1' from the following equation (decimal notation calculation).
    $X_1'=Y_2'-Y_1'$
14) Calculate D3D from the following table
    (D3D is hexadecimal notation)

X_1' value	D3D
$-1 \leqq X_1' \leqq 1$	F0
$X_1'>1$	F1
$X_1'<-1$	FF

15) Set data: D3D to page: F, address: 3D, and press the PAUSE button of the adjusting remote control unit.
16) Specifying the Red position
    1. Set data: 59 to page: 1, address: E6.
    2. Set data: 6D to page: 1, address: E7.
17) Read the average value of the DDS display B–Y data (Note 2), and set to R_2.
18) Convert R_2 to decimal notation to obtain R_2'.
19) Calculate X_2' from the following equation (decimal notation calculation).
    $X_2'=R_2'-R_1'$
20) Calculate D3E from the following table.

X_2' value	D3E
$X_2' \geqq 0$	00
$0 > X_2' \geqq -1$	01
$-1 > X_2'$	02

21) Set data: D3E to page: F, address: 3E, and press the PAUSE button of the adjusting remote control unit.

Processing after completing adjustments

1) Set data: 00 to page: F, address: 60, and press the PAUSE button of the adjusting remote control unit.
   (Release of the sampling mode)
2) Set data: 38 to page: F, address: 14, and press the PAUSE button of the adjusting remote control unit.
   (Color modulation ON mode setting)
3) Set data: 00 to page: F, address: AF, and press the PAUSE button of the adjusting remote control unit.
   (Release of the R–Y•B–Y data display mode)
4) Turn the main power supply (6.3V) off.

Note 2: As the R–Y data and B–Y data are displayed alternatively, it will be difficult to distinguish between the R–Y data and the B–Y data.
Record this data on a tape, and perform frame advancing playback so that only the R–Y data or the B–Y data is read.
(Example)
If the frame advancing playback is performed, the following will be displayed.

$$63\underline{88} \rightarrow \underline{8B}61 \rightarrow 61\underline{8B} \rightarrow \underline{8A}63 \rightarrow$$
$$65\underline{89} \rightarrow \underline{8B}60 \rightarrow 60\underline{8A} \rightarrow \underline{89}63$$

As the R–Y data is above 80, and the B–Y data is below 7F, the data which is underlined is the R–Y data .
If the average value is calculated, the R–Y data will become 8A and the B–Y data will becames 62.

25. Title Color Reproduction Adjustment

Subject	All black (Cover the lens with a black cap)
Measurement Point	Video output terminal
Measuring Instrument	Vectorscope
Adjustment Page	D
Adjustment Address	14 (BLU R–Y), 15 (BLU B–Y), 16 (GRN R–Y), 17 (GRN B–Y), 18 (CYN R–Y), 19 (CYN B–Y), 1A (RED R–Y), 1B (RED B–Y), 1C (VIO R–Y), 1D (VIO B–Y), 1E (YEL R–Y), 1F (YEL B–Y)
Specified Value	Each title color luminance point should settle within each color reproduction frame.

Note: For details on the page D address list, refer to "Service mode" in "Video Section Adjustments".

Adjusting method:

1) Release the protect of page D.
   Page: 1, address: 00, data: 01
2) Press the superimpose button "memory".
3) Use the "color/mode" button to change the title color to "blue".
4) Change the data of addresses 14 and 15 of page D, and and settle the blue luminance points within the blue (B) color reproduction frame.

Note: Be sure to press the PAUSE button of the adjusting remote control unit before changing the address.if not, the new data will not be written to the memory.

5) Adjust for green (addresses 16, 17), cyan (addresses 18, 19), red (addresses 1A, 1B), violet (addresses 1C, 1D) and yellow (addresses 1E, 1F) in the same way.

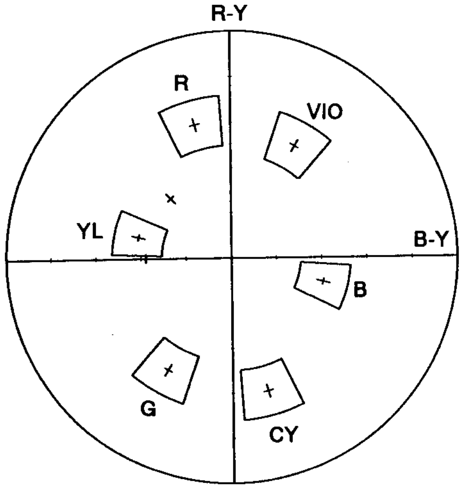


Fig. 7-19.

26. VIDEO OUT Level Check

Subject	Color bar chart standard picture frame
Measurement Point	Video output terminal (Terminated at 75 Ω)
Measuring Instrument	Oscilloscope
Specified Value	Y level=680 ± 40 mV SYNC level=300 ± 20 mV BURST level=300 ± 30 mV

Checking method:

1) Check that the Y level, SYNC level and BURST level satisfy the specified values.

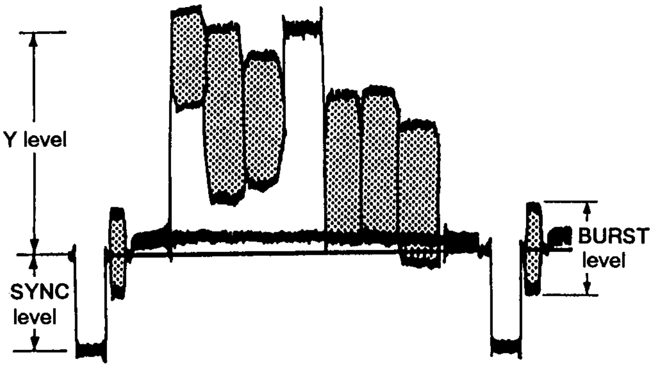


Fig. 7-20.

7-3. ELECTRONIC VIEWFINDER SYSTEM ADJUSTMENT (VF-44 BOARD)

7-3-1. Horizontal Tilt Adjustment

Mode	Playback
Signal	Alignment tape for checking operation (WR5-5CSP) Monoscope portion
Specified Value	See Fig. 7-22.

Adjustment method:

1) Adjust RV503 (BRIGHT) for appropriate brightness on CRT screen.
2) Loosen the DY (deflection yoke) tightening nut. (See Fig. 7-21.)
3) Make a picture horizontal by turning the DY.
4) Retighten the nut. (Do not tighten excessively.)

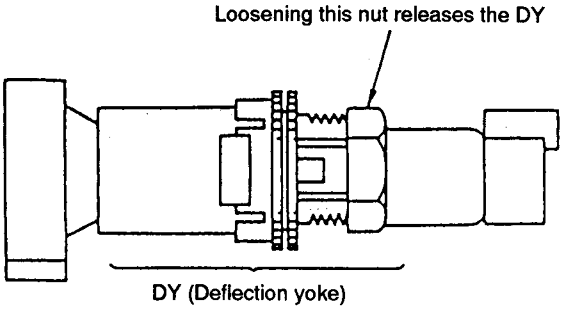
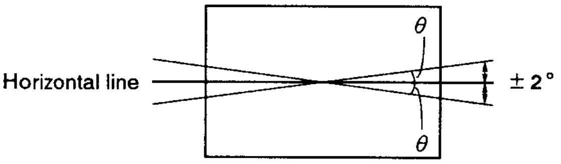


Fig. 7-21.



Specified value: Image orientation within ± 2 ° of horizontal line.

Fig. 7-22.

7-3-2. Centering Adjustment

Mode	Playback
Signal	Alignment tape for checking operation (WR5-5CSP) Monoscope portion
Specified Value	See Fig. 7-24.

Adjustment method:

1) Turn the centering adjustment rings to provide an image with even right, left, upper and lower margins. (See Fig. 7-23.)

Note: Since the centering position is affected by the earth magnetism, turn the equipment over 360 ° horizontally, and make adjustments at the orientation which exhibits median displacements of the image.

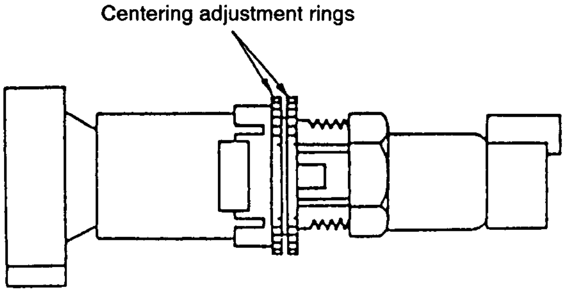


Fig. 7-23.

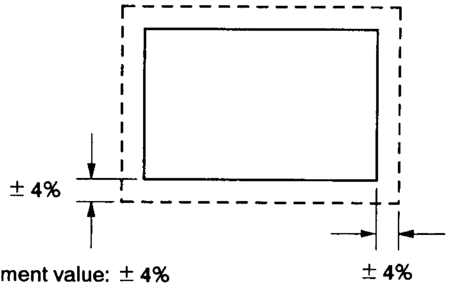


Fig. 7-24.

7-3-3. AFC Adjustment (VF-44 Board)

Mode	E-E or Camera standby
Signal	Color bar
Measurement Point	C517 ⊕ side
Measuring Instrument	Digital voltmeter or oscilloscope (DC range)
Adjustment Element	RV504 (AFC)
Specified Value	2.30 ± 0.05 Vdc

Adjustment method:

1) Adjust RV504 (AFC) for 2.30 ± 0.05 Vdc.

7-3-4. Horizontal Amplitude Adjustment (VF-44 Board)

Mode	Playback
Signal	Alignment tape for checking operation (WR5-5CSP) Monoscope portion
Adjustment Element	C504
Specified Value	6 ± 3%

Adjustment method:

1) Line up the upper and lower sections of the monoscope image with the upper and lower edges of the screen by RV505 (V SIZE).
2) Rotate RV503 (BRIGHT) to set the brightness to the normal level.
3) Short or open the pattern A of the H size adjustment capacitor (C504) to provide horizontal overscans of 6 ± 3% (total of left and right). (See Fig. 7-26.)

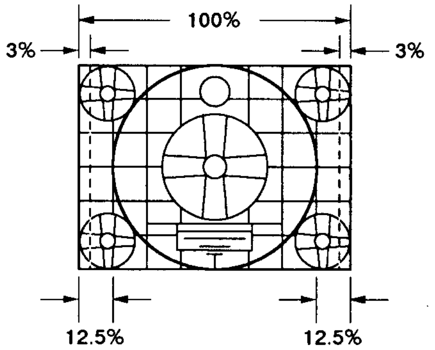
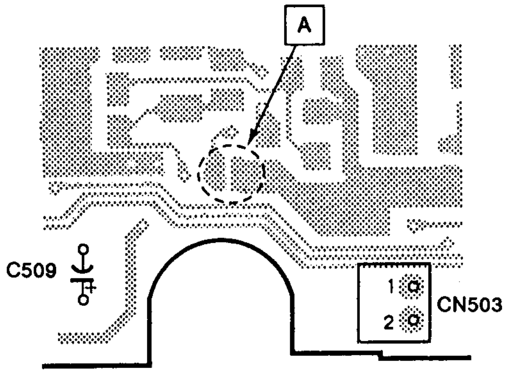

100%
3%
3%
12.5%
12.5%

Fig. 7-25.


A
C509
1
2
CN503

VF-44 BOARD (COMPONENT SIDE)

A section	H size
Short	Large
Open	Small

Fig. 7-26.

7-3-5. Vertical Amplitude Adjustment (VF-44 Board)

Mode	Playback
Signal	Alignment tape for checking operation (WR5-5CSP) Monoscope portion
Adjustment Element	RV505 (V SIZE)
Specified Value	6 ± 3%

Adjustment method:

1) By turning RV505 (V SIZE), adjust vertical overscan to 6 ± 3% (upper and lower total).

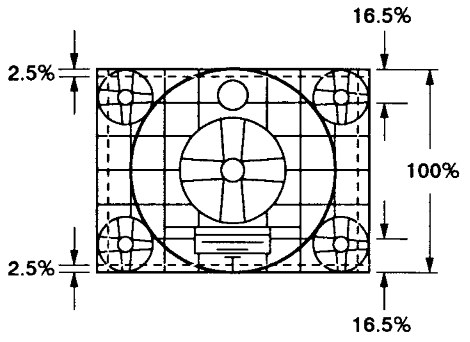

16.5%
2.5%
100%
2.5%
16.5%

Fig. 7-27.

7-3-6. Focus Adjustment (VF-44 Board)

Mode	Playback
Signal	Alignment tape for checking operation (WR5-5CSP) Monoscope portion
Adjustment Element	RV502 (FOCUS)

Adjustment method:

1) Adjust to the best focus point with RV502.

7-3-7. Brightness, Contrast Adjustments (VF-44 Board)

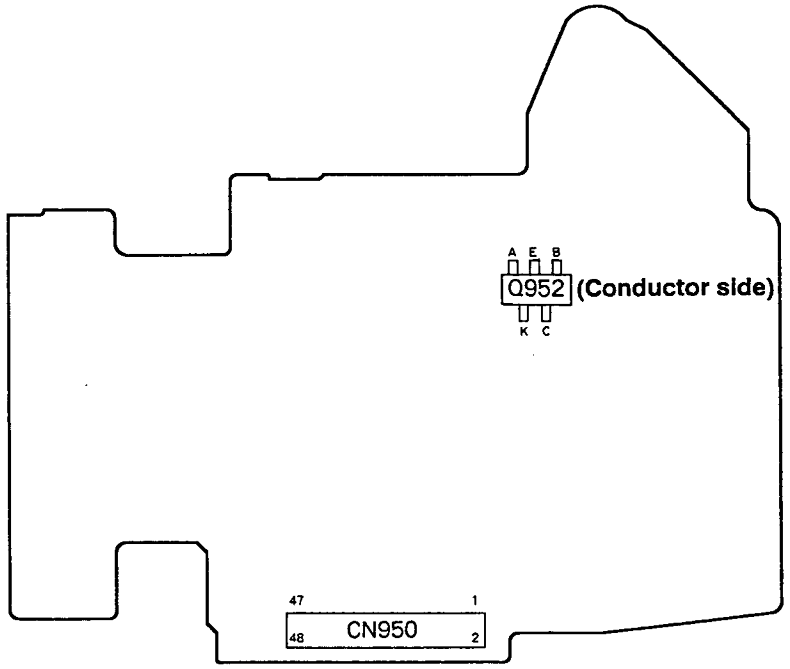
Mode	Playback
Signal	Alignment tape for checking operation (WR5-5CSP) Monoscope portion
Adjustment Element	Brightness: RV503 (BRIGHT) Contrast: RV501 (CONT)

Adjustment method:

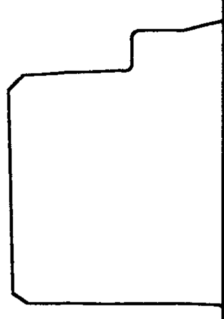
1) Adjust RV503 (BRIGHT) and RV501 (CONT) alternately until the bright and dark areas of a gray scale are displayed correctly. (The bright areas should not be made too bright to avoid a fuzzy display of the cross-hatches in the monoscope circle, and the brightness of the dark areas should be such that discrimination between the darkest and second darkest area is possible.)

7-4. ARRANGEMENT DIAGRAM FOR ADJUSTMENT PARTS

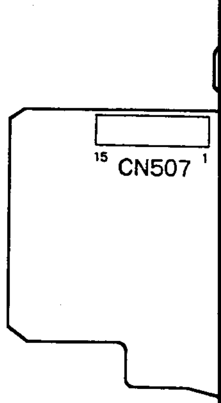
PS-300 BOARD (COMPONENT SIDE)


A E B
Q952
(Conductor side)
K C
47
1
48
CN950
2

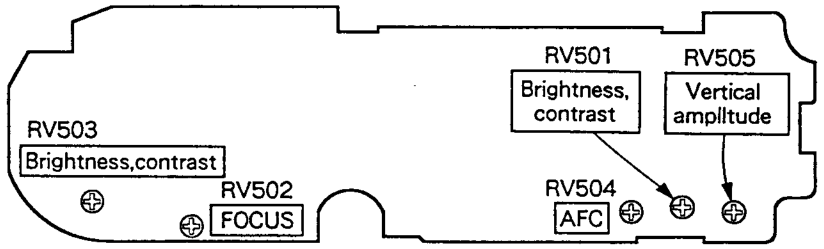
CS-35 BOARD (C



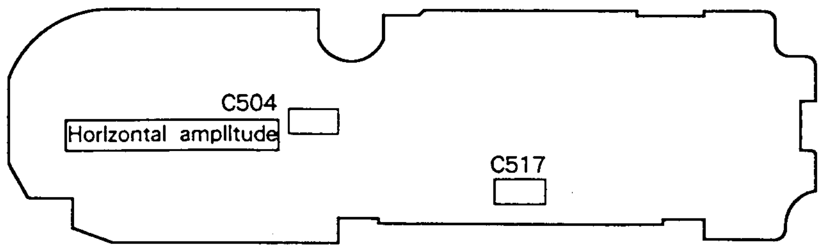
CS-35 BOARD (C



VF-44 BOARD (COMPONENT SIDE)


RV501
Brightness, contrast
RV505
Vertical amplitude
RV503
Brightness,contrast
RV502
FOCUS
RV504
AFC

VF-44 BOARD (CONDUCTOR SIDE)


C504
Horizontal amplitude
C517

Board)

g operation

rscan to 6 ±

%

g operation

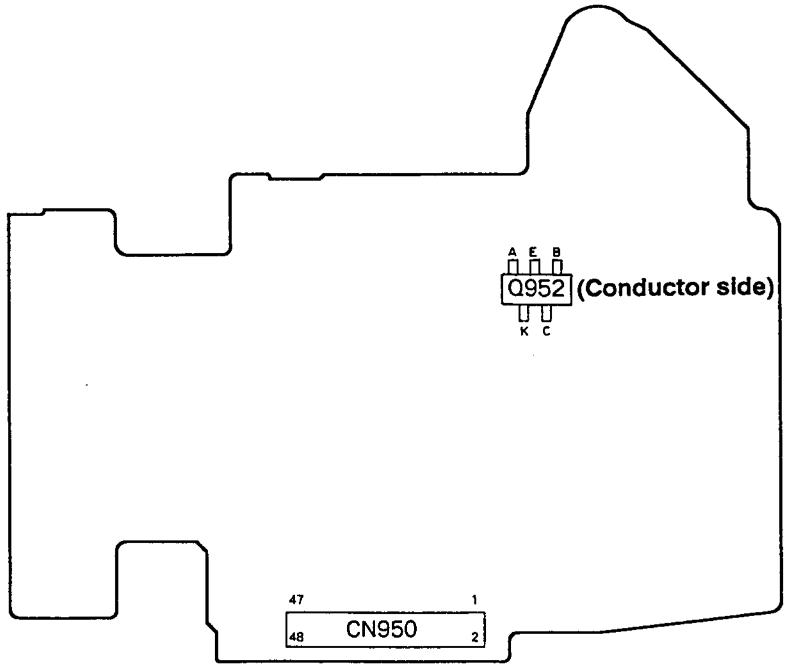
g operation

HT)
)

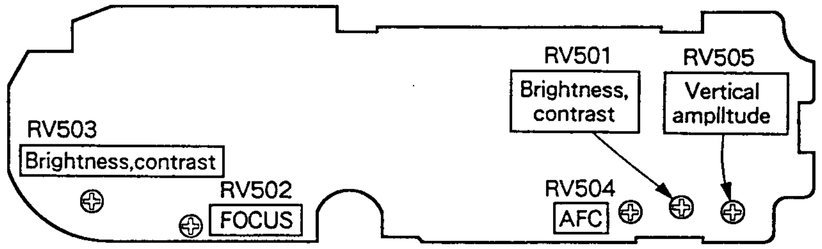
) alternately
re displayed
too bright to
monoscope
uld be such
ond darkest

7-4. ARRANGEMENT DIAGRAM FOR ADJUSTMENT PARTS

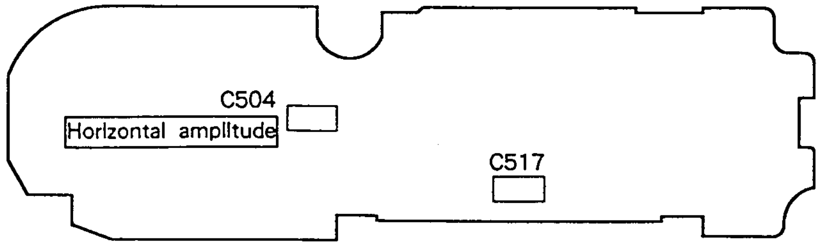
PS-300 BOARD (COMPONENT SIDE)


A E B
Q952
(Conductor side)
K C
47
1
48
CN950
2

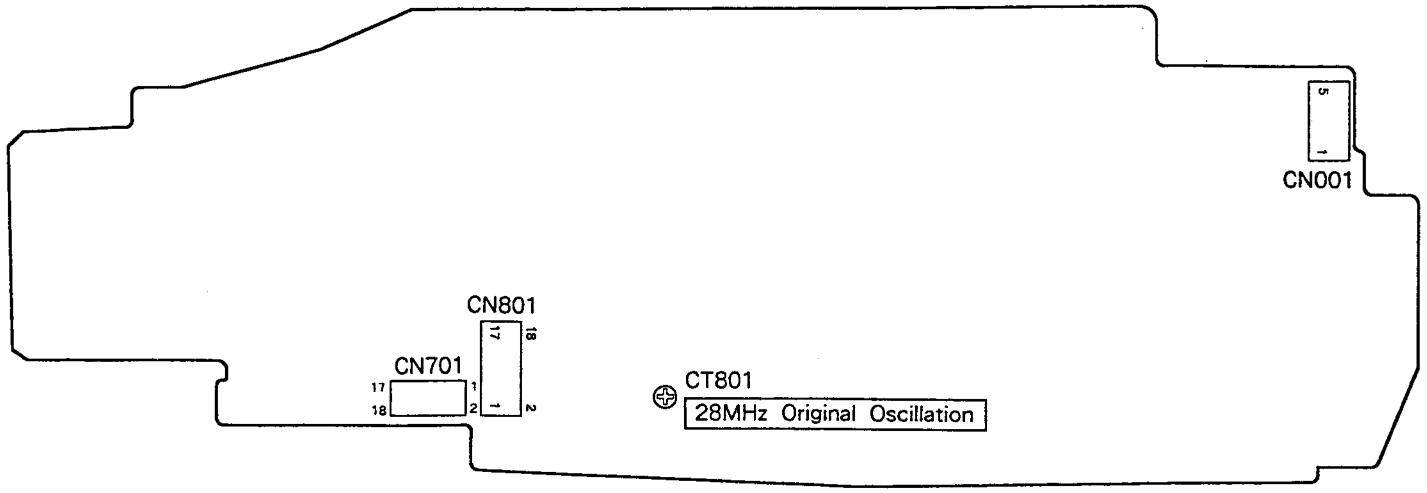
VF-44 BOARD (COMPONENT SIDE)


RV501
Brightness, contrast
RV505
Vertical amplitude
RV503
Brightness,contrast
RV502
FOCUS
RV504
AFC

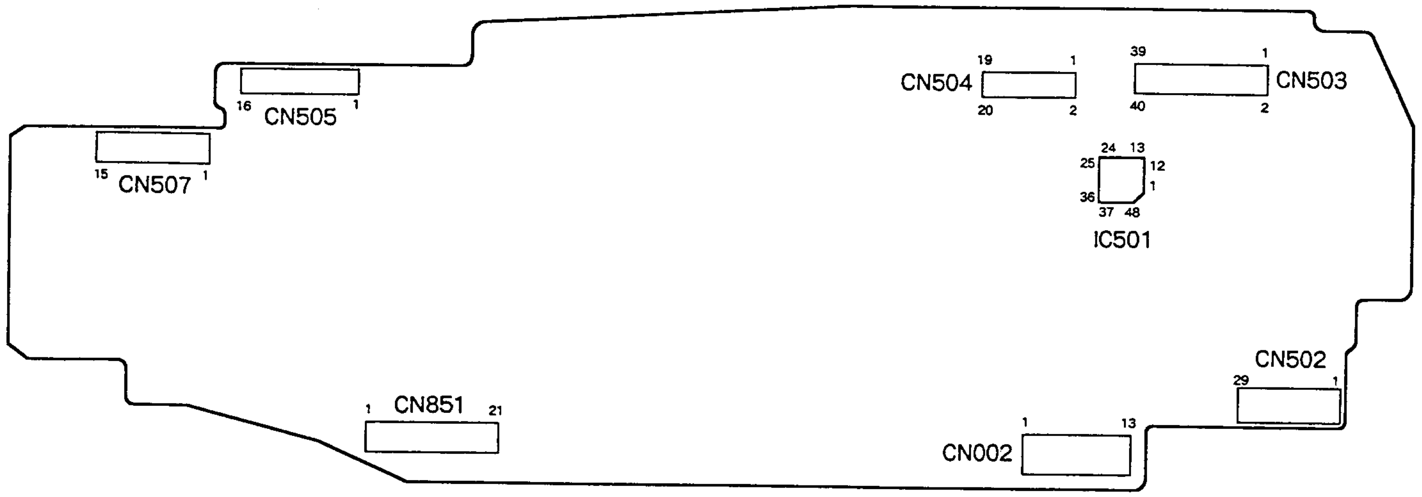
VF-44 BOARD (CONDUCTOR SIDE)


C504
Horizontal amplitude
C517

CS-35 BOARD (COMPONENT SIDE)


5
1
CN001
CN801
17
18
CN701
17
18
1
2
1
2
CT801
28MHz Original Oscillation

CS-35 BOARD (CONDUCTOR SIDE)


16
CN505
1
15
CN507
1
19
1
CN504
20
2
39
1
CN503
40
2
24 13
25
12
1
36
37 48
IC501
CN502
29
1
1
CN851
21
1
13
CN002

SECTION 8
MECHANICAL SECTION ADJUSTMENTS

For Mechanical Adjustments

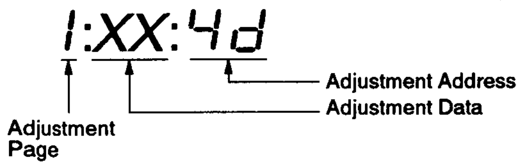
Refer to the separate volume of mechanical adjustment "8 mm Video MECHANICAL ADJUSTMENT MANUAL Ⅳ (A Mechanism)" for the adjustments and checks of mechanism section and the mechanical parts replacement. (9-973-199-11)
For setting of the track shift mode, however, refer to the following.

8-1. SETTING THE TRACK SHIFT MODE

Note: Camera part and video part should have been installed.

[Setting Method]

1) Set the adjustment commander to the HOLD ON side.
2) Set page: 1, address: 01 and data: 01, and then release the protector.
3) Set page: D and address: 01.
4) Set adjustment data to 03 (test mode 3) by PLAY or STOP button.
   (When HOLD OFF once after the setting and HOLD ON again, the display of the address data will be changed. To set the another mode with shifting, repeat the procedures from 3).)
5) Set to the HOLD OFF side in order to set the normal mode.



8-2. PREPARATION FOR ADJUSTMENT

1) Clean the tape running surfaces (tape guides, drum, capstan shaft, pinch roller.)
2) Connect to the oscilloscope.
   CH1: CS-35 board CN001 pin ③ (PB RF)
   CH2: CS-35 board CN001 pin ④ (SWP)
3) Play back the tracking alignment tape (WR5-1CP: 8-967-995-07).
4) Check that the RF waveform of the oscilloscope is flat at both inlet and outlet sides. If not flat, make adjustment as follows. (Refer to Fig. 8-1 and 8-2)

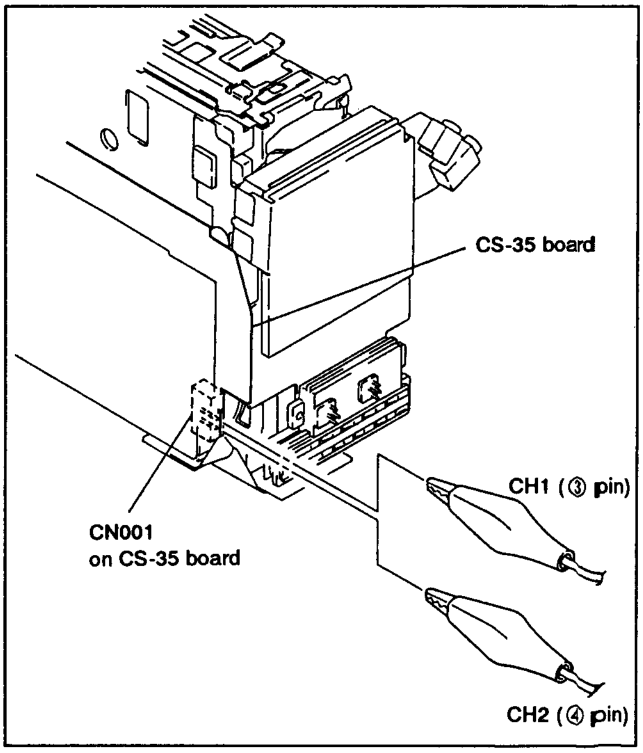


Fig.8-1.

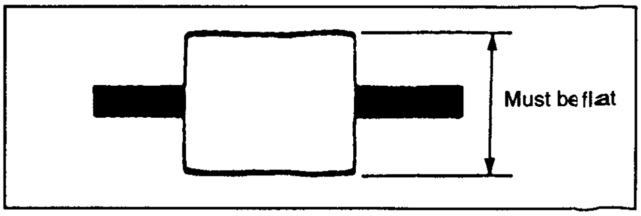


Fig.8-2.

SECTION 9
VIDEO SECTION ADJUSTMENT

When performing adjustments, refer to the layout diagrams for adjustment related parts beginning from page 252.

9-1. PREPARATIONS BEFORE ADJUSTMENT

The following adjusting instruments are used for adjusting the video section.

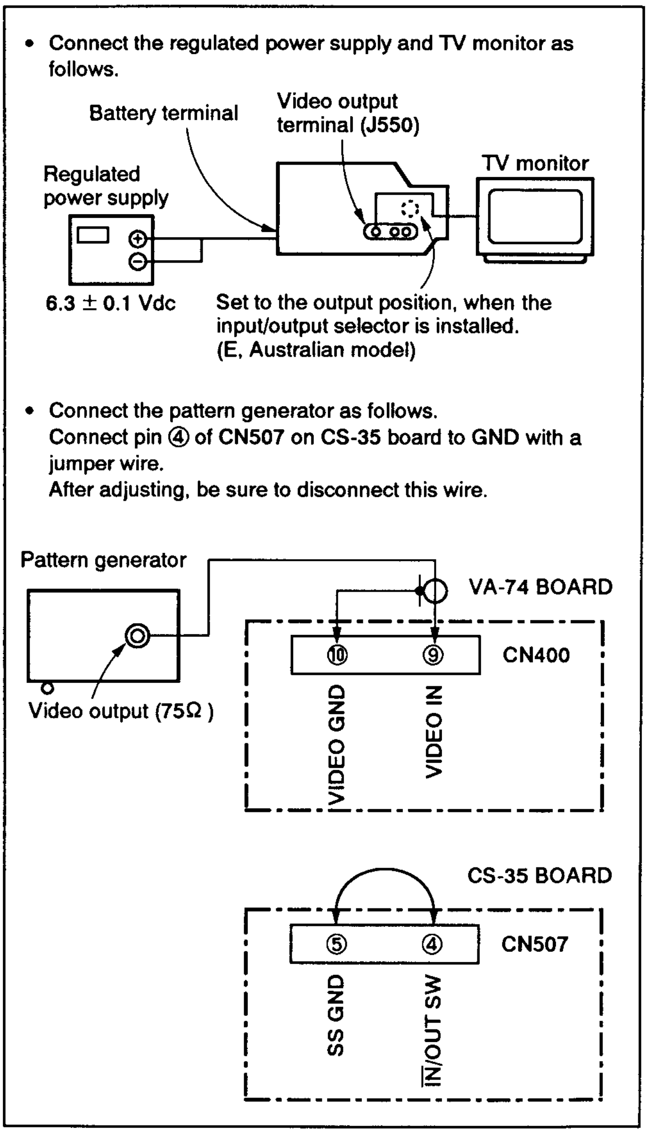
9-1-1. Equipments to be used

1) TV monitor
2) Oscilloscope: 2 phenomena, band 30 MHz or wider, with delay mode. (Use a 10:1 probe unless specified otherwise.)
3) Frequency counter
4) Pattern generator with video output terminal
5) Digital voltmeter
6) Audio generator
7) Audio level meter
8) Audio distortion meter
9) Audio attenuater
10) Regulated power supply
11) Alignment tape
    For tracking adjustment (WR5-1CP)
    Part Code: 8-967-995-07
    For video frequency characteristics adjustment (WR5-6C)
    Part Code: 8-967-995-17
    For checking operations
    (WR5-4CL)[Note 1]
    Part Code: 8-967-995-56
    (WR5-5CSP)[Note 2]
    Part Code: 8-967-995-47
    For checking AFM stereo operations (WR5-9CS)
    Part Code: 8-967-995-28
    Note: The following alignment tapes can also be used.
    1) WR5-3CL (8-967-995-36)
    2) WR5-4CSP (8-967-995-46)
12) Remote control unit for adjustment (J-6082-053-A)
13) VA-74 board extension cord (28P, 0.8 mm)
    Part Code: J-6082-174-A
14) VA-74 board extension cord (40P, 0.8 mm)
    Part Code: J-6082-168-A
15) Mecha deck extension cord (30P, 0.8 mm)
    Part Code: J-6082-167-A

9-1-2. Connecting the equipments

Unless specified otherwise, connect the measuring instruments as shown in Fig. 9-1 and perform the adjustments.

- Camera/video (or player) power switch ······· Position of the video (or player)
- Connect the adjusting remote control unit to the remote terminal (PS-300 board J951).



- Connect the regulated power supply and TV monitor as follows.

Set to the output position, when the input/output selector is installed. (E, Australian model)

- Connect the pattern generator as follows.
  Connect pin ④ of CN507 on CS-35 board to GND with a jumper wire.
  After adjusting, be sure to disconnect this wire.

Fig. 9-1.

9-1-3. Precautions upon adjustment

The MA-128 board (Mic amplifier) is not required for adjusting the video section. Disconnect CN571 (9 pins) on VK-24 board.

- Remove the following connector if the focus ring gets in the way.
  1. CN852 of CS-35 board (8 pins)

- Remove the two lens block installing screws and the following connectors if the lens block gets in the way.
  1. CN801 of the CS-35 board (18 pins)
  2. CN851 of the CS-35 board (21 pins)
  3. CN902 of the CD-76 board (5 pins)

- Use an extension cable when opening the VA-74 board.
  1. Between CN201 of VA-74 board and CN503 of CS-35 board.
     40 pins, 0.8 mm pitch extension cable (J-6082-168-A)
  2. Between CN202 of VA-74 board and CN504 of CS-35 board.
     28 pins, 0.8 mm pitch extension cable (J-6082-174-A)

- Use an extension cable when opening the CS-35 board, and when checking the operation of the mechanical section.
  1. Between CN502 of CS-35 board and FP-425 board.
     30 pins, 0.8 mm pitch extension cable (J-6082-167-A)

- If cabinet (R) gets in the way, remove the following connectors after setting to the forced POWER ON mode using the adjusting remote control unit.
  1. CN505 of the CS-35 board (16 pins)

[How to set the forced POWER ON mode]

1. Release the protect of page D with the adjusting remote control unit.
   Page: 1, Address: 00, Data: 01
2. Select address 21 of page D.
3. When the power is turned on in the VTR mode, set data 02. (Set data 01 when the power is turned on in the CAMERA mode.)
4. Press the PAUSE button of the adjusting remote control unit.
5. Disconnect the main power supply (6.3V).

The forced POWER ON mode has been set by the above operations. Hereafter, when the main power is supplied, the power will turn on in the VTR mode (or CAMERA mode). As the position of the power supply switch (CAMERA/OFF/VTR (or player)) and the presence/absence of the power supply switch becomes unrelated, the cabinet (R) can be removed.
Be sure to release the forced POWER ON mode after completing repair/adjustment.

[How to release the forced POWER ON mode]

1. Release the protect of page D.
   Page: 1, Address: 00, Data: 01
2. Select address 21 of page D, and set data: 00.
   (Forced POWER ON mode releasing)
3. Press the PAUSE button of the adjusting remote control unit.

9-1-4. How to Set the REC Mode in the Model without REC Switch

1. REC key forbidden accept mode cancel
   1. Connect the adjustment remote controller to the REMOTE terminal.
   2. Turn on the power.
   3. Turn on the HOLD switch of the adjustment remote controller.
   4. Select the page: 1 address: 00, and set the data to 01. (Protect mode cancel)
   5. Select the page: D address: 02, and set the data to 8F. (REC key forbidden accept mode cancel)
   6. Press PAUSE button on the adjustment remote controller. (Write to the non-volatile memory)

The REC key is accepted through the above procedure. The adjustment remote controller may be removed, hereafter.

2. REC mode setting
   1. Connect Pin ⑭ of CN507 (KEY IN 1) and Pin ⑨ of CN507 (KEY OUT 3) on CS-35 board with a jumper wire until the VTR is set to REC mode.

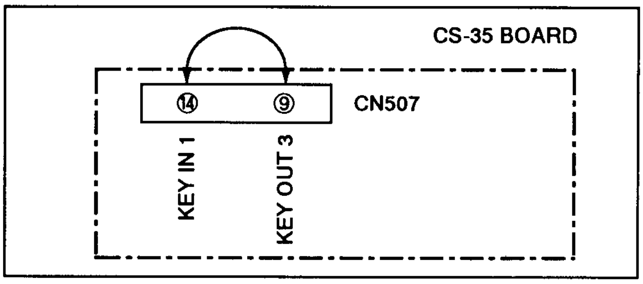


Fig. 9-2.

3. Procedure after completed the adjustment
   Be sure to return the mode to REC key forbidden accept mode after adjustment.
   1. Connect the adjustment remoter controller to the REMOTE terminal.
   2. Turn on the power.
   3. Turn on HOLD switch of the adjustment remote controller.
   4. Select the page: 1 address: 00, and set the data to 01. (Protect mode cancel)
   5. Select the page: D address: 02, and set the data to 8E. (Setting of the REC key forbidden accept mode)
   6. Press PAUSE button on the adjustment remote controller. (Write to the non-volatile memory)

9-1-5. Set-up during Adjustment

As the video signal obtained from the pattern generator is used as an adjustment signal during electric adjustments, ensure that this video output signal is within the specification. Connect the oscilloscope to pin ⑨ of CN400 on the VA-74 board, and check that the amplitude of the sync signal of the video signal is approximately 0.3V, the amplitude of the video section is approximately 0.7V, the amplitude of the burst signal is approximately 0.3V and flat, and that the level ratio of the burst signal and the [red] signal is 0.30: 0.66. The video signal (color bar) used for electric adjustments is shown in Fig. 9-2.

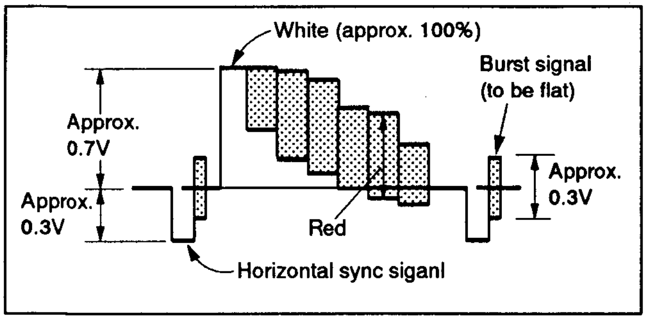

White (approx. 100%)
Burst signal
(to be flat)
Approx.
0.7V
Approx.
0.3V
Approx.
0.3V
Red
Horizontal sync siganl

Fig. 9-3. Color Bar Signal of the Pattern Generator

9-1-6. Alignment Tape

The following table lists alignment tapes which are available. Use the tape specified in the signal column for each adjustment. If the type of tape to be used for checking operations is not specified, use whichever type.

Name	Recording mode	Tape type	Tape speed	Recording contents		Usage
				Video area	PCM area	
Tracking WR5-1CP	L	MP	SP	CH2: Signal for 1 MHz tape path adjustment		Tape path adjustment Switching position adjustment
Video frequency characteristics WR5-6C	L	MP	LP	RF sweep 0 to 10 MHz Marker 1, 3.58, 5.5, 7 MHz		Frequency characteristics adjustment
Operation check (SP mode) WR5-5CSP	L	MP	SP	• Video signal Color bar 4 minutes Monoscope 4 minutes • Audio signal (AFM) 400 Hz 60% modulation	• Audio signal (PCM) Monoscope section 20 Hz 20 sec. 400 Hz 20 sec. } Color bar section 14 kHz 20 sec. Repeated 4 times 1 kHz 4 minutes	Checking operations
Operation check (LP mode) WR5-4CL	L	MP	LP	• Video signal Color bar 4 minutes Monoscope 4 minutes • Audio signal (AFM) 400 Hz 60% modulation		
AFM stereo Operation check WR5-9CS	L	MP	SP	• Video signal Color bar 4 minutes Monoscope 4 minutes • Audio signal (AFM) Stereo section (color bar) Lch: 400 Hz, Rch: 1 kHz (L+R: 1.5 MHz ± 60 kHz DEV L–R: 1.7 MHz ± 30 kHz DEV) Bilingual section (Monoscope) MAIN: 400 Hz (1.5 MHz ± 60 kHz DEV) SUB: 1 kHz (1.7 MHz ± 30 kHz DEV)	• Audio signal (PCM) 400 Hz	AFM stereo Checking operations

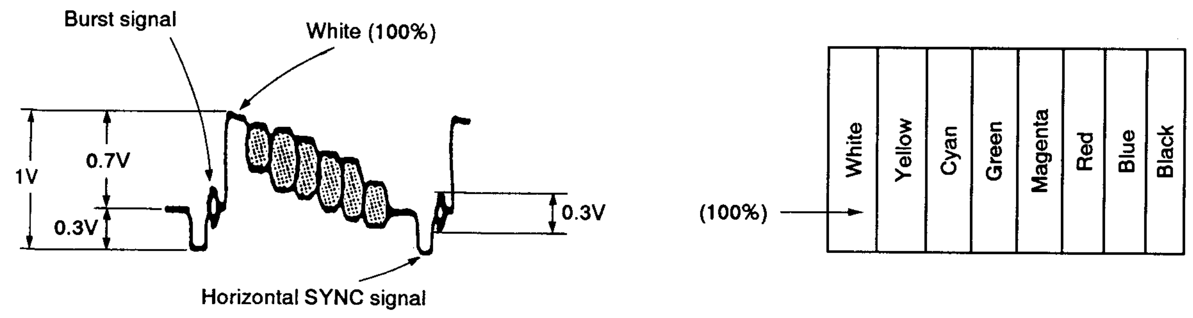
Note: Recording mode
L Conventional mode
E hi8 (hi band) mode

Tape type
MP Particle type metal tape
ME Evaporated type metal tape

Table 9-2.

Fig. 9-3. shows the 75% color bar signals recorded on the alignment tape.

Note: Measure at the video output terminal (Terminated at 75 Ω)


Burst signal
White (100%)
1V
0.7V
0.3V
0.3V
Horizontal SYNC signal
(100%)
White
Yellow
Cyan
Green
Magenta
Red
Blue
Black

Color bar signal waveform

Color bar pattern

Fig. 9-4. Alignment tape color bar signal

9-1-7. Input/Output Level and Impedance

1. E, Australian model

[I/O level and Impedance]

Video input/output	phone jack Input signal: 1 Vp-p, 75Ω unbalanced, negative sync
Audio input/output	phone jack Input level: –7.5 dBs (0 dBs=0.775 Vrms) Input impedance: More than 47 kΩ Output level: –7.5 dBs (at output impedance 47 kΩ) Output impedance: More than 2.2 kΩ

2. AEP, UK model

[I/O level and Impedance]

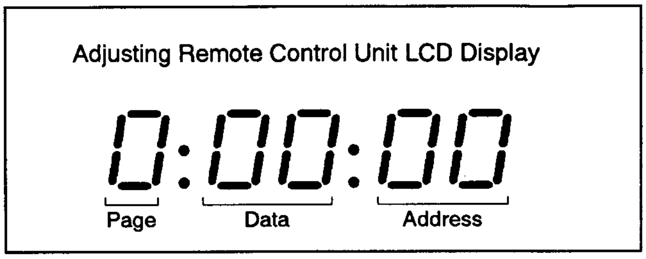
Video output	phone jack Output signal: 1 Vp-p, 75Ω unbalanced, negative sync
Audio output	phone jack Specified output: –7.5 dBs Output impedance: More than 2.2 kΩ

9-1-8. Service Mode

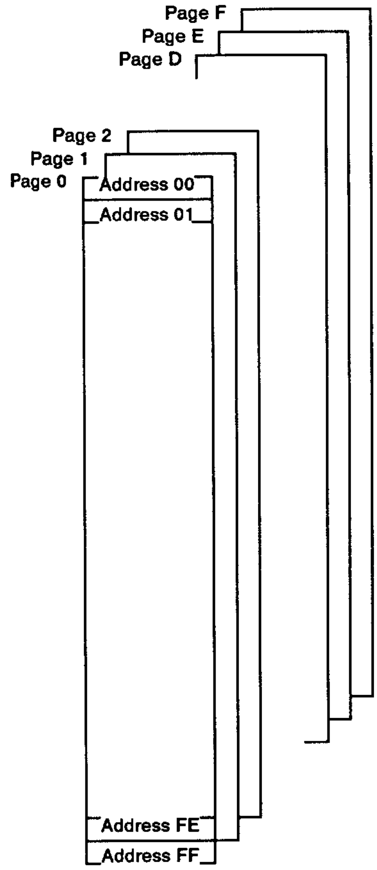
1. Setting the Service mode

The service mode consists of the adjustment mode which adjusts the EVR and the test mode which displays the condition of the unit.

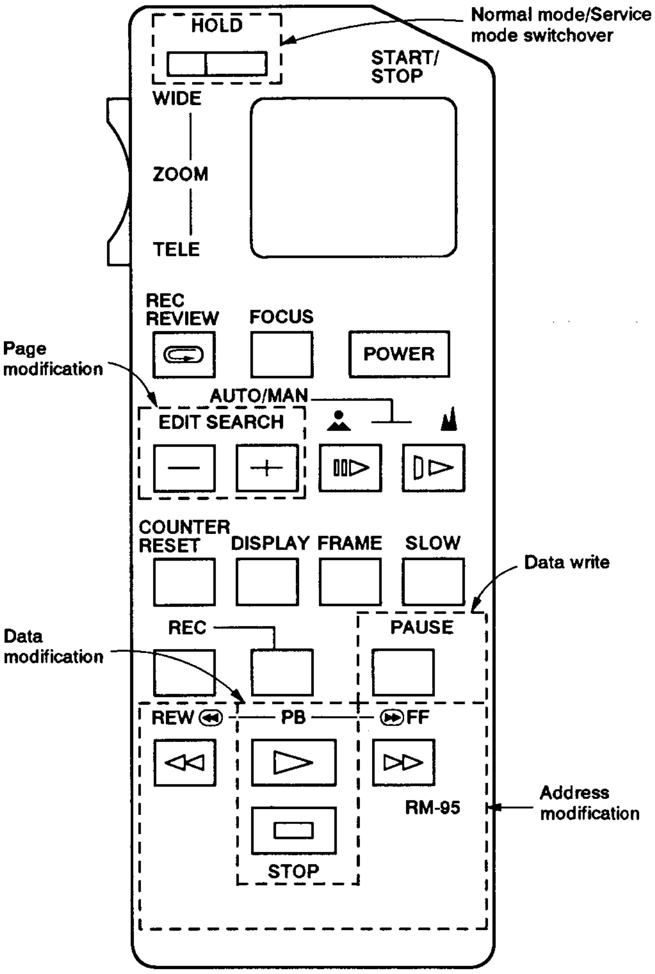
The unit can be shifted into the test mode and adjustment mode by connecting the adjusting remote control unit (set the HOLD switch to the HOLD side).


Adjusting Remote Control Unit LCD Display
0:00:00
Page
Data
Address

(1) Service LANC memory map

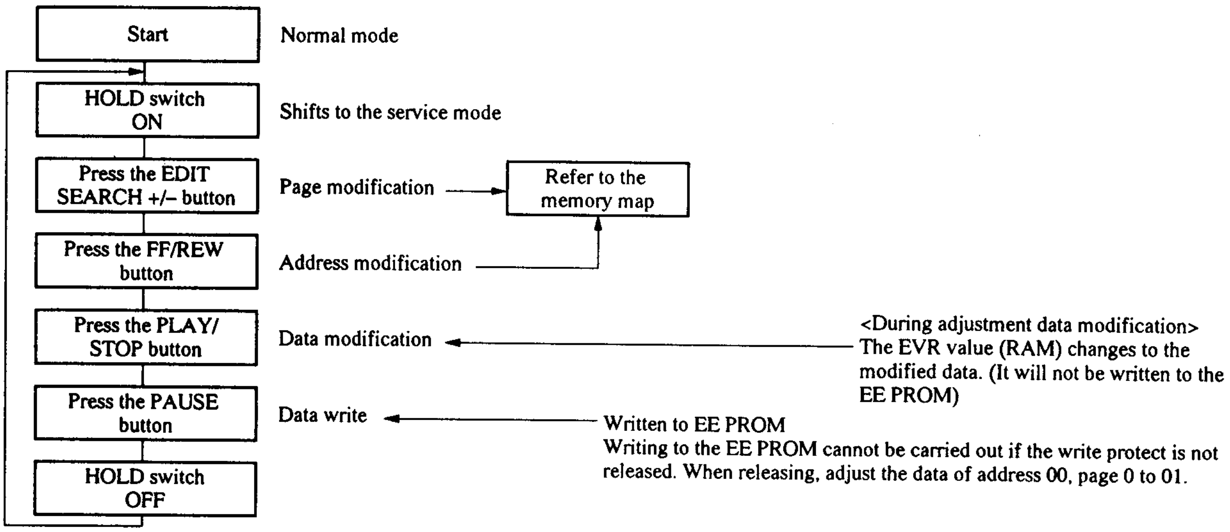

Page F
Page E
Page D
Page 2
Page 1
Page 0
Address 00
Address 01
Address FE
Address FF

Adjusting remote control unit RM-95 (J-6082-053-A)


HOLD
Normal mode/Service mode switchover
START/STOP
WIDE
ZOOM
TELE
REC REVIEW
FOCUS
POWER
Page modification
AUTO/MAN
EDIT SEARCH
−
+
COUNTER RESET
DISPLAY
FRAME
SLOW
Data write
REC
PAUSE
Data modification
REW
PB
FF
RM-95
Address modification
STOP

Page	Page allocation	Description
0	Not used	
1	Mode Control RAM, I/O	RAM and I/O interface data memory area required for operating the mode controller. Data is not held when the power is turned off because this area is not ROM.
2~4	Mechanical Control RAM, I/O	RAM and I/O memory area of the mechanical controller.
5	Not used	
6~8	Camera Control RAM, I/O	RAM and I/O memory area of the camera control.
9	Not used	
A	Camera Control RAM, I/O	RAM and I/O memory area of the camera control.
B, C	Not used	
D	VTR EE-PROM	ROM memory area of the VTR part. Data of this area is held by EE-PROM when the power is turned off. Releasing protect is required for changing data.
E	Not used	
F	Camera EE-PROM	ROM memory area of the camera part. Data of this area is held by EE•P•ROM when the power is turned off.

(2) Shifting to the Service Mode Using the Adjusting Remote Control Unit


Start
Normal mode
HOLD switch ON
Shifts to the service mode
Press the EDIT SEARCH +/– button
Page modification
Refer to the memory map
Press the FF/REW button
Address modification
Press the PLAY/ STOP button
Data modification
Press the PAUSE button
Data write
HOLD switch OFF

<During adjustment data modification>
The EVR value (RAM) changes to the modified data. (It will not be written to the EE PROM)

Written to EE PROM
Writing to the EE PROM cannot be carried out if the write protect is not released. When releasing, adjust the data of address 00, page 0 to 01.

Command Name	**Command Function**	**Normal LANC command**
Page Up	Page +1	Edit Search +
Page Down	Page –1	Edit Search –
Direc Page Set	Sets the specified page	Event Clear
Address Up	Address +1	Fast Forward
Address Down	Address –1	Rewind
Data Up	Data +1	Play Back
Data Down	Data –1	Stop
Store	Write the data to the EE PROM. RAM	Pause

2. Types of Self-diagnostic Feature

MODE		Contents
TEST	Camera adjustment	Refer to Camera Adjustment
	Switching position adjustment	Refer to each adjustment page
	Battery DOWN adjustment	
	Video, Audio adjustment	
ADJUST	Pass Adjustment track shift	When adjusting tape pass, set this mode and shift the tracking.
	Emergency STOP inhibition	Detection of emergency is inhibited. This allows the following items. • Power is not turned off when the battery is ended. • SP/LP is not automatically distinguished. • Emergence is not detected except for TOP/END detection of the TAPE.
	Read of emergence code	The following functions are added to the emergency display function currently in use. ① The lithium battery is not required because to memorize into EE-PROM is allowed. ② The first emergency and the last emergency are memorized. ③ The mode when the emergency is generated is memorized, in addition to the emergency contents.
	Motor single check	Rotating in forward direction, reverse direction, stopping of each motor can be separately controlled. • Drum motor • Capstan motor • Loading motor
	Function switch check	The acceptance of the function switch of the unit can be confirmed by designating an address. On the contrary, RM-95 can command the substitution for the function switch of the unit.
	Mechanical switch check	The contents of the mechanical switch and the mode switch can be confirmed.
	Sensor check	The following sensor is input by performing A/D converting, and the A/D converted value can be confirmed. TOP sensor, End sensor, S REEL FG, T REEL FG, Thermistor for SWP correction, DEW sensor.
	Reception contents check of wireless remote control	The received code contents of the remote control code can be confirmed.

3. Page D Write Protect

Release/set the page D write protect.

Page 1	Address 00

Data	Function
00	Normal (Write protect condition)
01	Write protect release

4. Page F Write Protect

Release/set the page F write protect.

Page 6	Address 00

Data	Function
10	Normal (Write protect condition)
01	Write protect release

5. Test Mode Setting

Each type of test mode is set/released. Release the protect (page: 1, address: 00, data: 01), before setting the data.

Page D	Address 01

Data	Function
00	Normal
01	Test mode 1 Various emergency inhibition and release Drum, capstan, loading motor, reel, tape top, end, DEW SP/LP automatic distinction inhibition, manual switchover (EDIT SW ON: LP, OFF: SP) 5 minutes pause release inhibition Power off inhibition • release by battery end
02	Test mode 2 1'CH frequency response adjustment SP/LP automatic distinction inhibition, manual switchover (EDIT SW ON: LP, OFF: SP)
03	Test mode 3 Track shift Plays back the track shift Rear lock distinction inhibition during PB SP/LP automatic distinction inhibition, manual switchover (EDIT SW ON: LP, OFF: SP)
04	Test mode 4 Rear lock mode Rear lock playback is performed SP/LP automatic distinction inhibition, manual switchover (EDIT SW ON: LP, OFF: SP)
05	Test mode 5 SP/LP automatic distinction inhibition, manual switchover (EDIT SW ON: LP, OFF: SP)

※ This address data will be recorded on the non-volatile memory by pressing the PAUSE button on the adjusting remote control unit. Take note, as when this happens, the test mode will not be released even if the main power is turned off (6.3 Vdc).

※ Be sure to return the data of this address data to 00 after completing adjustments/repairs.

6. Emergency code

Troubles (errors) can be checked.

Page D	Address 06

First emergency code

······The first error code generated

Page D	Address 07

Last emergency code

······ The last error code generated (this data will be modified each time an error occurs.)

※ Be sure to rewrite the data of addresses 06 and 07 to 00 after completing repairs/adjustments.

※ When rewriting data, be sure to press the PAUSE button of the remote control unit after resetting the data.

Code	Error condition
00	No error
01	Loading motor error
02	Reel error during unloading
03	Other reel errors
04	Capstan error
05	DRUM FG error during drum start up
06	DRUM PG error during drum start up
07	DRUM FG error during drum regular condition
08	DRUM PG error during drum regular condition
09	DRUM Phase error during drum regular

7. Emergency mode

The operation mode during an error outbreak can be checked.

Page D	Address 08

First emergency mode
······The operation mode when the first error is generated

Page D	Address 09

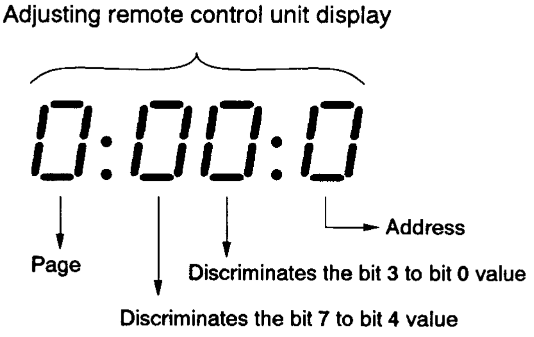
Last emergency mode
······The operation mode when the last error is generated
(This data will be modified each time an error occurs.)

※ Be sure to rewrite the data of addresses 08 and 09 to 00 after completing repairs/adjustments.
※ When rewriting data, be sure to press the PAUSE button of the remote control unit after setting the data.
※ Addresses 08 and 09 of page 0 and addresses 08 and 09 of page D have the same functions.

Code	Error condition
00	BEFOR INITIALIZE
01	EJECTED
02	NORMAL STOP
03	FF
04	NORMAL REC
06	NORMAL PB
07	PB PAUSE
12	LOADING
14	REC PAUSE
26	X1
27	1/5 SLOW
31	UNLOADING
36	-X1
37	-1/5 SLOW
46	CUE
47	1/10 SLOW
56	REVIEW
57	-1/10 SLOW
62	STOP TAPE END
66	X2
67	FRAME
72	STOP TAPE TOP
76	-X2
77	-FRAME
83	REWIND
85	REC REVIEW(+)
95	REC REVIEW(-)
A2	EMERGENCY STOP
A5	EDIT SEARCH(+)
B1	EMERGENCY UNLOADING
B2	STOP EMERGENCY 1
B5	EDIT SEARCH(-)
C2	STOP EMERGENCY 2
E2	STOP NO CASSETTE
F5	EDIT PAUSE

8. Bit value Discrimination

It is necessary to discriminate the bit value by the adjusting remote control unit display data for the following items. Discriminate if the bit value is "1" or "0" using the following table.


Adjusting remote control unit display
0:00:0
Address
Page
Discriminates the bit 3 to bit 0 value
Discriminates the bit 7 to bit 4 value

Remote Control Unit Display	Bit Value			
	bit 3 or bit 7	bit 2 or bit 6	bit 1 or bit 5	bit 0 or bit 4
0	0	0	0	0
1	0	0	0	1
2	0	0	1	0
3	0	0	1	1
4	0	1	0	0
5	0	1	0	1
6	0	1	1	0
7	0	1	1	1
Ⓐ→ 8	1	0	0	0
9	1	0	0	1
A(A)	1	0	1	0
B(b)	1	0	1	1
C(c)	1	1	0	0
D(d)	1	1	0	1
Ⓑ→ E(E)	1	1	1	0
F(F)	1	1	1	1

(Example) When the remote control unit display data is "8E", the bit values of bit 7 to bit 4 can be discriminated from column Ⓐ, and that of bit 3 to bit 0 can be discriminated from column Ⓑ.

9. Check of Power Switch, Tape Distinction Switch, etc.

Page 1	Address 3E

Bit7	Bit6	Bit5	Bit4	Bit3	Bit2	Bit1	Bit0
				$\overline{\text{REC PROOF}}$	ME/$\overline{\text{MP}}$	Hi8/$\overline{\text{Normal}}$	HG/$\overline{\text{Normal}}$

"1"=Recording impossible
"0"=Recording possible

"1"=ME tape
"0"=MP tape

"1"=Hi8 mode playback
"0"=Normal mode playback

"1"=HG tape
"0"=Others

Page 1	Address 23

Bit7	Bit6	Bit5	Bit4	Bit3	Bit2	Bit1	Bit0
					$\overline{\text{CC DOWN}}$		

"0"=During cassette compartment lock

10. RECOG SW Check

Page 1	Address 3D

Bit7	Bit6	Bit5	Bit4	Bit3	Bit2	Bit1	Bit0
V MUTE	A MUTE	VA PB MODE	JOG	PB CLOG	REC CLOG	SYNC DET	LP/$\overline{\text{SP}}$

"1"=LP mode playback
"0"=SP mode playback

"1"=SYNC is detected
"0"=SYNC is not detected

"1"=CLOG is detected
"0"=Normal

"1"=When the PB RF signals are being playback normaly
"0"=Others

"1"=JOG mode
"0"=Other

"1"=Playback mode
"0"=Others

"1"=AUDIO MUTE: ON
"0"=AUDIO MUTE: OFF

"1"=VIDEO MUTE: ON
"0"=VIDEO MUTE: OFF

11. Individual Operations of the Drum, Capstan, and Loading Motor

Page 4	Address 11

1) Adjust the mechanical section to the loading completion condition.
2) Release the protect.
   Page: 1, address: 00, data: 01
3) Set data: 01 to page: 4, address: 0E.
   (Control permission from the adjusting remote control unit of the motor)
4) By setting the data in the following table to page: 4, address: 11, the corresponding motors can be operated individually.
5) After checking the operations, turn off the main power (6.3 Vdc).

Data	Operation
00	Normal
02	Drum forward rotation
04	Drum reverse rotation
06	Capstan forward rotation
08	Capstan reverse rotation
0A	Loading motor forward rotation
0C	Loading motor reverse rotation
03	All motors stop
05	
07	
09	
0B	
0D	
0F	

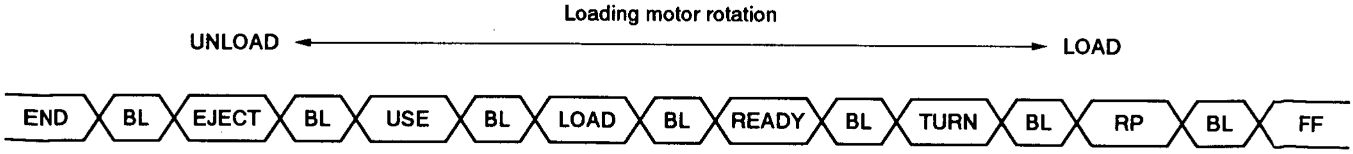
12. Mode Switch Check

The mode switch position (mechanical section condition) can be checked.

Page 1	Address 3E

Bit7	Bit6	Bit5	Bit4	Bit3	Bit2	Bit1	Bit0
MSW 0	MSW 1	MSW 2					

			POSITION	FUNCTION	$\overline{\text{CC DOWN}}$
0	0	0	BL	Interval of each position	
0	1	1	END	FULL END processing (T side lock removal)	1
0	0	1	EJECT	Cassette compartment ejection	1
1	0	1	USE	EJECTED (Unskate end)	1
0	0	1	LOAD	LOADING (Skate in)	0
1	0	0	READY	NORMAL STOP position	0
1	1	0	TURN	OFF of pinch roller only with PB ↔ REV (oscillating position)	0
0	1	0	RP	PB, REC, RVS, REV, REW	0
0	0	0	FF	FF/CUE	0



13. Mode control micro processor key matrix check

The key input can be checked.

Page 1	Address 68~6D

	Bit7	Bit6 (K IN 6)	Bit5 (K IN 5)	Bit4 (K IN 4)	Bit3 (K IN 3)	Bit2 (K IN 2)	Bit1 (K IN 1)	Bit0 (K IN 0)
Address 68 (K OUT 0)		BEEP ON/OFF	VTR POWER	EDIT SEARCH (+)	EDIT SEARCH (−)		START/STOP	STANDBY
Address 69 (K OUT 1)			CAMERA POWER	ZERO MEMORY	COUNTER RESET	FF	REW	EJECT
Address 6A (K OUT 2)			REMOTE ON/OFF	PROGRAM AE	TAPE/BATT CHECK	STOP	PLAY	EDIT ON/OFF
Address 6B (K OUT 3)			EVENT	TIME	DATE	PAUSE	REC	HI-FI SOUND 1 (MAIN)
Address 6C (K OUT 4)			MEMORY	BACK LIGHT	FADER			HI-FI SOUND 2 (SUB)
Address 6D (K OUT 5)		AUTO FOCUS ON/OFF	AUTO LOCK	SUPER IMPOSE ON/OFF	COLOR/MODE			

14. Wireless Remote Control Unit Reception Content Check

Page 1	Address 1E

Wireless remote control unit key pressed	Data
None	FF
TELE	9A
WIDE	9B
Start/stop	99
Rewind	1B
Fast forward	1C
Stop	18
Playback	1A
Data screen	5A
Pause	19
SLOW	23

15. Page D Address List

Note 1: The adjustment data initial value is the data to be input before performing video section adjustment (page D), when the page D data has been erased due to some cause.

Note 2: The data listed in the adjustment data memo column are the fixed data.
Check that these data have not been accidentally rewritten, after completing adjustments.

*1 No mark: AEP, UK model
< >: E, Australian model

Address	Name	Function [ ] indicate the adjustment voltage output terminal	Adjustment data	
			Initial value	Memo column
00	Category code	Not used	00	00
01	Test mode		00	00
02	Destination flag		8E<8F>*1	8E<8F>*1
03	BATT END	Battery end adjustment	90	
04	SW POSITION	SW POSITION adjustment	80	
05	SW POSITION	SW POSITION adjustment	0B	
06	EMERGENCY code (FIRST)	Error code and mode are memorized. Rewrite the data of these addresses to 00 after repairs/adjustments	00	00
07	EMERGENCY code (LAST)		00	00
08	EMERGENCY mode (FIRST)		00	00
09	EMERGENCY mode (LAST)		00	00
0A	SR DATA (MP NORMAL SP)	CXA1207 serial data	24	24
0B	SR DATA (MP NORMAL LP)	CXA1207 serial data	16	16
0C	SR DATA (ME Hi8 SP)	CXA1207 serial data	24	24
0D	SR DATA (ME Hi8 LP)	CXA1207 serial data	16	16
0E	SR DATA (ME NORMAL SP)	CXA1207 serial data	24	24
0F	SR DATA (ME NORMAL LP)	CXA1207 serial data	16	16
10	SR DATA (MP Hi8 SP)	CXA1207 serial data	24	24
11	SR DATA (MP Hi8 LP)	CXA1207 serial data	16	16
12	SR DATA (EDIT ON NORMAL)	CXA1207 serial data	24	24
13	SR DATA (EDIT ON Hi8)	CXA1207 serial data	16	16
14	CAM TITLE BLU R-Y	Camera titler color adjustment [Blue]	7D	
15	CAM TITLE BLU B-Y	Camera titler color adjustment [Blue]	A8	
16	CAM TITLE GRN R-Y	Camera titler color adjustment [Green]	64	
17	CAM TITLE GRN B-Y	Camera titler color adjustment [Green]	5E	
18	CAM TITLE CYN R-Y	Camera titler color adjustment [Light blue]	62	
19	CAM TITLE CYN B-Y	Camera titler color adjustment [Light blue]	8A	
1A	CAM TITLE RED R-Y	Camera titler color adjustment [Red]	9E	
1B	CAM TITLE RED B-Y	Camera titler color adjustment [Red]	76	
1C	CAM TITLE VIO R-Y	Camera titler color adjustment [Violet]	9C	
1D	CAM TITLE VIO B-Y	Camera titler color adjustment [Violet]	A2	
1E	CAM TITLE YEL R-Y	Camera titler color adjustment [Yellow]	82	
1F	CAM TITLE YEL B-Y	Camera titler color adjustment [Yellow]	57	
20		X2MUTE, SIRCS EJECT etc	2C	2C
21		FORCED VTR ON, CAM ON etc DATA / MODE 01 FORCED CAMERA POWER ON 02 FORCED VTR POWER ON	00	00

Table 9-2 (1).

Address	Name	Function [ ] indicate the adjustment voltage output terminal	Adjustment data	
			Initial value	Memo column
22~29		Not used		
2A		Slow blake adjust (Forward)	00	
2B		Slow blake adjust (Reverse)	00	
2C		Still blake adjust	00	
2D	BATT REMAIN 1	Amount of remaining battery	A2	
2E	BATT REMAIN 2	Amount of remaining battery Battery end adjustment	9E	
2F	BATT REMAIN 3	Amount of remaining battery	98	
30~39		Not used		
3A	MT 1'CH	Not used [IC204 ③]	FF	FF
3B~42		Not used		
43	MT 1CH	1CH playback frequency characteristics adjustment [IC204 ⑲]	B1	
44		Not used		
45	MT 2CH	2CH playback frequency characteristics adjustment [IC204 ②]	A7	
46	REC C RF (EE)	REC C RF adjustment [IC203 ⑩]	6B	
47	REC C RF (PB)	Playback REC C RF level [IC203 ⑩]	00	00
48	RF CONT (ME)	ATF RF level (ME) [IC204 ④]	77	77
49	RF CONT (MP)	ATF RF level (MP) [IC204 ④]	70	70
4A	EE LEVEL	EE level adjustment [IC203 ⑮]	68	
4B		Not used		
4C	COMB ADJ	Chroma comb filter adjustment [IC203 ③]	9A	
4D	SR-IR	IR adjustment [IC203 ②]	A5	
4E		Not used		
4F	CARR	Y-FM carrier frequency adjustment [IC203 ⑤]	AB	
50		Not used		
51	DEV	Y-FM deviation adjustment [IC203 ⑥]	93	
52		Not used		
53		Not used		
54	REC Y (ME)	REC Y recording current adjustment (ME) [IC203 ⑦]	59	
55	REC Y (MP)	REC Y recording current adjustment (MP) [IC203 ⑦]	59	
56	REC Y (PB)	Playback REC Y level [IC203 ⑦]	00	00
57	PB Y (EE)	EE PB Y level [IC204 ⑮]	00	00
58	PB Y (E)	Hi8 PB Y level adjustment [IC204 ⑮]	00	
59	PB Y (L)	Normal PB Y level adjustment [IC204 ⑮]	6C	
5A	EMPH LVL (EE)	EE emphasis input level adjustment [IC203 ④]	85	
5B	EMPH LVL (PB)	Playback emphasis input level adjustment [IC203 ④]	A9	
5C~77		Not used		
78	REC MATRIX	REC matrix adjustment [IC204 ⑫]	AD	
79	PB MATRIX	PB matrix adjustment [IC204 ⑫]	A9	
7A	1.5 IR	1.5 MHz IR adjustment [IC204 ⑤]	A3	
7B	1.5 DEV	1.5 MHz deviation adjustment [IC204 ⑥]	8D	
7C	1.7 IR	1.7 MHz IR adjustment [IC204 ⑧]	7D	
7D	1.7 DEV	1.7 MHz deviation adjustment [IC204 ⑨]	5C	
7E	AUDIO FADER	Audio fader [IC204 ⑦]	00	00
7F~FF		Not used		

Table 9-2 (2)

9-2. POWER SYSTEM ADJUSTMENTS

1. Oscillator Frequency Check (PS-300 board)

Mode	Camera record
Subject	Arbitrary
Measurement Point	Q952 collector
Measuring Instrument	Frequency counter
Specified Value	464 ± 5 kHz

Adjusting method:

1) Check that the oscillator frequency satisfies the specified value.

2. Power Voltage Check (PS-300 board)

Mode	Camera record
Subject	Arbitrary
Measuring Instrument	Digital voltmeter
EVF 5V check	
Measurement Point	Pin ⑥ of CN950
Specified Value	5.01 ± 0.15 Vdc
D5V check	
Measurement Point	Pins ⑰ and ⑱ of CN950
Specified Value	4.98 ± 0.15 Vdc
D4V check	
Measurement Point	Pins ⑮ and ⑯ of CN950
Specified Value	4.03+0.15 Vdc
VIDEO 5V check	
Measurement Point	Pins ② and ④ of CN950
Specified Value	5.00 ± 0.10 Vdc
SS 5V check	
Measurement Point	Pin ㉓ of CN950
Specified Value	5.02 ± 0.15 Vdc
AUDIO 5V check	
Measurement Point	Pin ⑧ of CN950
Specified Value	5.04 ± 0.15 Vdc
CAM5V check	
Measurement Point	Pins ⑬ and ⑭ of CN950
Specified Value	4.90 ± 0.15 Vdc
15V check	
Measurement Point	Pin ⑪ of CN950
Specified Value	15.04 ± 0.4 Vdc
–9V check	
Measurement Point	Pin ⑫ of CN950
Specified Value	–8.5 ± 0.4 Vdc

9-3. SYSTEM CONTROL SYSTEM ADJUSTMENTS

1. Page D Initial Value Input

If the page D data has been erased due to some cause, input the page D initial value before performing adjustments. For details on the initial value, refer to “Page D address list” in “9-1-8. Service Mode”.

Mode	E-E
Signal	Arbitrary
Adjustment Page	D
Adjustment Address	00 to 7E

Input method:

1) Release the write protect.
   Page: 1, address: 00, data: 01
2) Select page D, and input the initial value to each address.
   (After setting the data (initial value), be sure to press the PAUSE button of the adjusting remote control unit before changing the address.)

2. Battery End Adjustment

Mode	Camera record
Signal	Arbitrary
Measurement Point	LCD display of the adjusting remote control unit
Measuring Instrument	
Adjustment Page	D
Specified Value	03 (BATT END) 2D (BATT REMAIN 1) 2E (BATT REMAIN 2) 2F (BATT REMAIN 3)

Connection:

1) Connect the regulated power supply and the digital voltmeter as shown in Fig. 9-5.

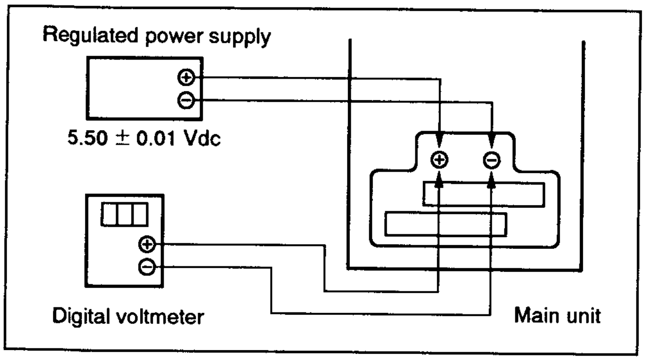


Fig. 9-5.

Adjusting method:

1) Adjust the output voltage of the regulated power supply so that the digital voltmeter display is 6.3 ± 0.1 Vdc.
2) Release the protect.
   Page: 1, address: 00, data: 01
3) Set data: 01 to page: 4, address: 01.
   (Test mode 1 setting)
4) Decrease the output voltage of the regulated power supply so that the digital voltmeter display is 5.50 ± 0.01 Vdc.
5) Select page: 4, address: 10, read the adjusting remote control unit display data, and set to D_{10}.
6) Set data D_{10} to page: D, address: 03, and press the PAUSE button of the adjusting remote control unit.
7) Convert D_{10} to decimal notation, and obtain D_{10}'. (Refer to Table 7-6. "Hexadecimal notation–decimal notation conversion table")
8) Calculate D_{2D}', D_{2E}' and D_{2F}' using following equations (decimal notation calculation).
   $D_{2D}'=D_{10}'+18$
   $D_{2E}'=D_{10}'+14$
   $D_{2F}'=D_{10}'+8$
9) Convert D_{2D}', D_{2E}' and D_{2F}' to hexadecimal notation, and obtain D_{2D}, D_{2E} and D_{2F}.
10) Set data: D_{2D} to page: D, address: 2D, and press the PAUSE button of the adjusting remote control unit.
11) Set data: D_{2E} to page: D, address: 2E, and press the PAUSE button.
12) Set data: D_{2F} to page: D, address: 2F, and press the PAUSE button.
13) Set data: 00 to page: 4, address: 01. (Test mode 1 release)
14) Perform "Battery Down Check".

3. Battery Down Check

Mode	Camera record
Subject	Arbitrary

Connection

1) Connect the regulated power supply and the digital voltmeter as shown in Fig. 9-5.

Checking method:

Remove the adjusting remote control unit, and perform the following check. If the check is not satisfied, perform from the beginning again.

1) Adjust the output voltage of the regulated power supply so that the digital voltmeter display becomes 6.3 ± 0.1 Vdc.
2) Set to the camera recording mode.
3) Decrease the output voltage of the regulated power supply so that the digital voltmeter display becomes 5.80 ± 0.01 Vdc.
4) Check that the 🔋 mark on the EVF (viewfinder) display is not lighted up. (TALLY lamp lights up).
5) Decrease the the output voltage of the regulated power supply so that the digital voltmeter display becomes 5.58 ± 0.01 Vdc.
6) Check that the 🔋 mark and the TALLY lamp on the EVF display on the EVF display blinks every second.
7) Decrease the the output voltage of the regulated power supply so that the digital voltmeter display becomes 5.42 ± 0.01 Vdc.
8) Check that the 🔋 mark and the TALLY lamp on the EVF display are blinking faster, the VTR stops and the power supply turns off.

9-4. SERVO SYSTEM ADJUSTMENTS

1. Switching Position Adjustment (CS-35 board)

Mode	Playback
Signal	Alignment tape: For tracking adjustment (WR5-1NP)
Measurement Point	CH1: Pin ④ of CN001 (RF SWP) CH2: Pin ③ of CN001 (PB RF)
Measuring Instrument	Oscilloscope
Adjustment Page	D
Adjustment Address	04 (SW POSITION) (LOW) 05 (SW POSITION) (HIGH)
Specified Value	$t_1 = 0 \pm 10$ μsec

Adjusting method:

1) Release the protect.
   Page: 1, address: 00, data: 01
2) Set data: 0B to page: D, address: 05.
3) Change the data of page: D, address: 05 and minimize "t1". (Coarse adjustment)
4) Change the data of page: D, address: 04, and adjust so that the switching position (t_1) becomes the specified value. (Fine adjustment)
5) Press the PAUSE button of the adjusting remote control unit.

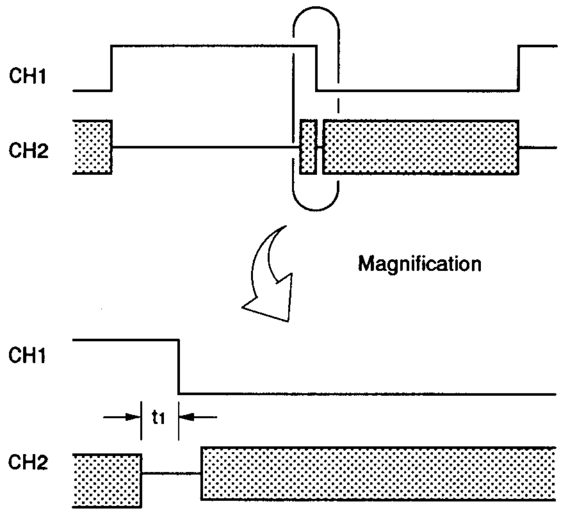


Fig. 9-6.

9-5. VIDEO ADJUSTMENTS

The adjustments of the video system must be performed according to the following adjustment procedure.
The color video signal supplied from the pattern generator is used as the video input signal for adjusting the video system in recording mode. Check that the sync signal and the color burst signal satisfy the specification specified during the adjustment set-up shown in Fig. 9-3.

[Adjusting procedure]

1) Playback frequency characteristic adjustment
2) Flying erase check
3) VXO oscillation frequency check
4) EE level adjustment
5) IR adjustment
6) Chroma comb filter adjustment
7) Emphasis input level adjustment
8) PB Y level adjustment
9) PB LINE OUT level adjustment
10) Y FM carrier frequency adjustment
11) Y FM deviation adjustment
12) Chroma emphasis f0 adjustment
13) REC Y level adjustment
14) REC C RF level adjustment
15) REC ATF level check

1. Playback Frequency Characteristic Adjustment (CS-35 board)

Note: The adjusting element for CH2 is shown in parentheses [ ].

Mode	Playback
Signal	Alignment tape: For frequency characteristic adjustment (WR5-6N)
Measurement Point	CH1: Pin ③ of CN001 EXT TRIG: Pin ④ of CN001
Measuring Instrument	Oscilloscope TRIG SLOPE: +, [–]
Adjustment Page	D
Adjustment Address	43 (MT 1CH) [45 (MT 2CH)]
Specified Value	3.58 MHz level: 5.5 MHz level= 4: (3 ± 0.3)

Adjusting method:

1) Confirm that the EDIT switch is OFF position.
2) Release the protect.
   Page: 1, address: 00, data: 01
3) Change the data of address: 43 [45] of page D, and adjust the level ratio of 3.58 MHz and 5.5 MHz of PB RF output waveform to the specified value.
   Note: After each address adjustment, be sure to press the PAUSE button of the adjusting remote control unit and memorize the data.

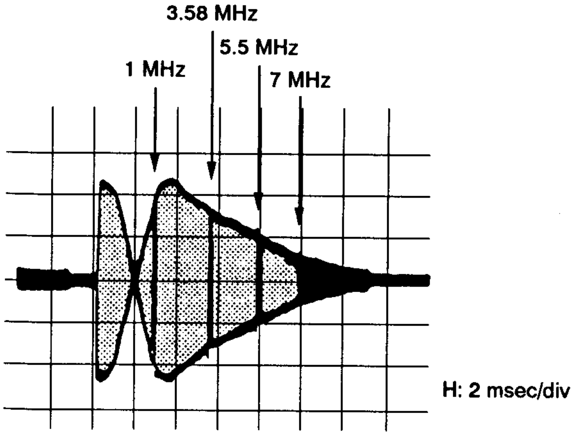


Fig. 9-7.

2. Flying Erase Check (CS-35 board)

Mode	Record
Signal	Arbitrary
Measurement Point	Pin ② of CN002 (FE (X))
Measuring Instrument	Oscilloscope and frequency counter
Specified Value	Frequency: Above 7.5 MHz Voltage: Above 7.0 Vp-p

Note: Use a MP type tape.

Checking method:

1) Check that the oscillation frequency is above 7.5 MHz and that the oscillation voltage is above 7.0 Vp-p.

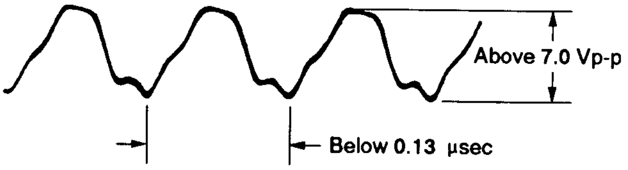


Fig. 9-8.

3. VXO Oscillation Frequency Check (VA-74 board)

Mode	Record
Signal	Color bar
Measurement Point	Pin ⑫ of IC301
Measuring Instrument	Frequency counter
Specified Value	4433619 ± 70 Hz

Note: Connect the frequency counter via a high impedance (approximately 10 MΩ) and low capacity (below 10 pF) buffer.

Adjusting method:

1) Check that the oscillation frequency of pin ⑫ of IC301 is 4433619 ± 70 Hz.

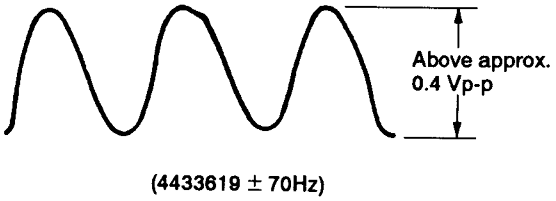


Fig. 9-9.

4. EE Level Adjustment (VA-74 board)

Mode	E-E
Signal	Color bar
Measurement Point	Pin ㉚ of IC201 (VIDEO OUT)
Measuring Instrument	Oscilloscope
Adjustment Page	D
Adjustment Address	4A (EE LEVEL)
Specified Value	A=0.50 ± 0.01V

Adjusting method:

1) Release the protect.
   Page: 1, address: 00, data: 01
2) Change the data of page: D, address: 4A, and adjust so that the Y signal level (A) becomes the specified value.
3) Press the PAUSE button of the adjusting remote control unit.

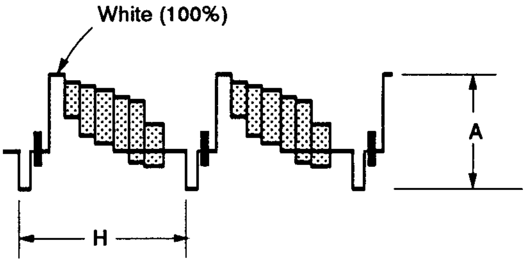


Fig. 9-10.

5. IR Adjustment (VA-74 board)

Mode	E-E
Signal	Color bar
Measurement Point	Pin ⑦ of IC201 (Y COMB OUT)
Measuring Instrument	Oscilloscope
Adjustment Page	D
Adjustment Address	4D (SR IR)
Specified Value	Residual chroma component (A) is minimum (below 80 mVp-p)

Connection

1) Connect pin ⑭ of IC201 (or pin ② of IC205) to pin (51) of IC201 with a jumper wire.

Adjusting method:

1) Release the protect.
   Page: 1, address: 00, data: 01
2) Change the data of page: D, address: 4D, and adjust so that the residual chroma component (A) becomes minimum.
3) Press the PAUSE button of the adjusting remote control unit.

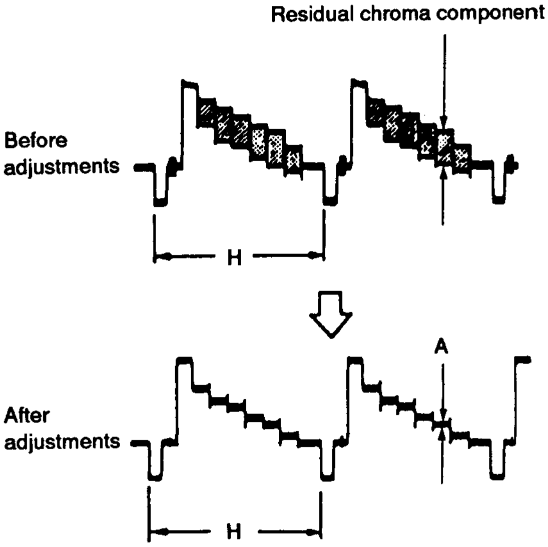


Fig. 9-11.

6. Chroma Comb Filter Adjustment (VA-74 board)

Mode	E-E
Signal	Color bar
Measurement Point	Pin ⑪ of IC201 (C+CD)
Adjusting Element	Oscilloscope
Measuring Instrument	RV051 (Phase)
Adjustment Page	D
Adjustment Address	4C (C COMB)
Specified Value	Residual chroma component (A) is minimum.

Adjusting method:

1) Release the protect.
   Page: 1, address: 00, data: 01
2) Change the data of page: D, address: 4C, and adjust the residual chroma component to minimum.
3) Adjust RV051 so that the residual chroma component (A) becomes minimum.
4) Repeat steps 2) through 3).
5) Press the PAUSE button of the adjusting remote control unit.

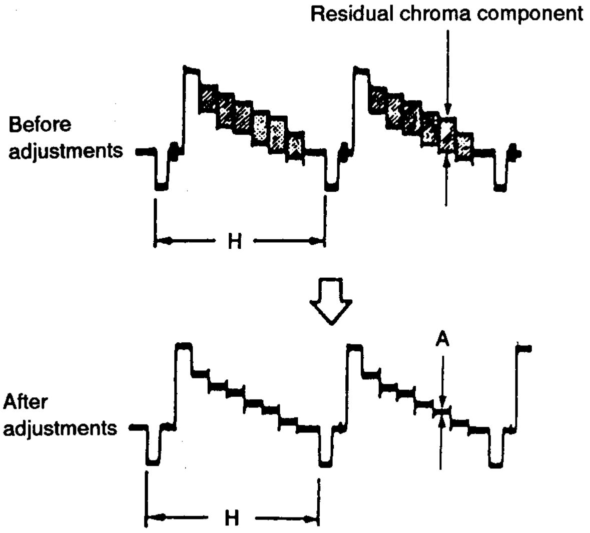


Fig. 9-12.

7. Emphasis Input Level Adjustment (VA-74 board)

Mode	E-E
Signal	Color bar
Measurement Point	Pin ⑤ of IC206 (or Pin ③ of IC201)
Measuring Instrument	Oscilloscope
Adjustment Page	D
Adjustment Address	5A (EMPH LVL (EE))
Specified Value	A=0.50 ± 0.025V

Adjusting method:

1) Release the protect.
   Page: 1, address: 00, data: 01
2) Change the data of page: D, address: 5A, and adjust so that the Y signal level (A) becomes the specified value.
3) Press the PAUSE button of the adjusting remote control unit.

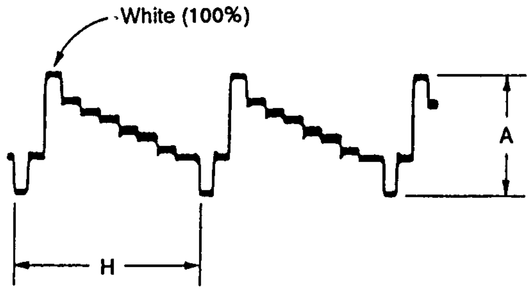


Fig. 9-13.

8. PB Y Level Adjustment (VA-74 board)

Mode	Playback
Signal	Alignment tape: For checking operations (WR5-5CSP) Color bar section
Measurement Point	Pin ㉑ of IC201
Measuring Instrument	Oscilloscope
Adjustment Page	D
Adjustment Address	59 (PB Y (L))
Specified Value	A=0.50 ± 0.025V

Adjusting method:

1) Release the protect.
   Page: 1, address: 00, data: 01
2) Playback the color bar section of the normal mode alignment tape (WR5-5CSP).
3) Change the data of page: D, address: 59, and adjust so that the Y signal level (A) becomes the specified value.
4) Press the PAUSE button of the adjusting remote control unit.

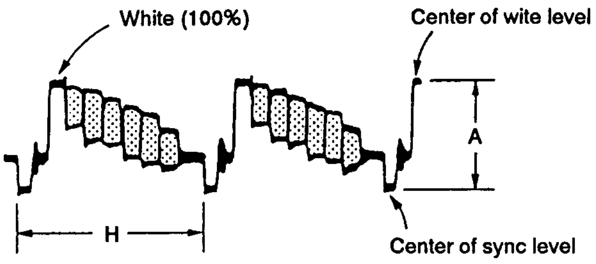


Fig. 9-14.

9. PB LINE OUT Level Adjustment

Mode	Playback
Signal	Alignment tape: For checking operations (WR5-5CSP) Color bar section
Measurement Point	Video output terminal (terminated at 75 Ω)
Measuring Instrument	Oscilloscope
Adjustment Page	D
Adjustment Address	5B (EMPH LVL (PB))
Specified Value	A=1.07 ± 0.05V

Adjusting method:

1) Release the protect.
   Page: 1, address: 00, data: 01
2) Change the data of page: D, address: 5B, and adjust so that the video signal level (A) becomes the specified value.
3) Press the PAUSE button of the adjusting remote control unit.

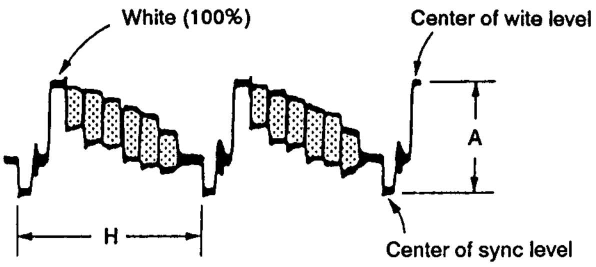


Fig. 9-15.

10. Y FM Carrier Frequency Adjustment (VA-74 board)

Mode	E-E
Signal	No signal
Measurement Point	Pin ㊸ of IC201 (Y RF OUT)
Measuring Instrument	Frequency counter
Adjustment Page	D
Adjustment Address	4F (Y FM CARRIER)
Specified Value	4.38 ± 0.04 MHz

Adjusting method:

1) Release the protect.
   Page: 1, address: 00, data: 01
2) Change the data of page: D, address: 4F, and adjust so that the Y FM carrier frequency becomes the specified value.
3) Press the PAUSE button of the adjusting remote control unit.
4) Perform "Deviation Adjustment".

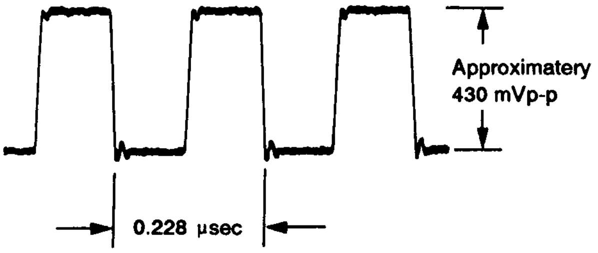


Fig. 9-16.

11. Deviation Adjustment (VA-74 board)

Mode	Record and playback
Signal	Color bar
Measurement Point	Pin ㉑ of IC201
Measuring Instrument	Oscilloscope
Adjustment Page	D
Adjustment Address	51 (Y FM DEVIATION)
Specified Value	A=0.50 ± 0.025V

Note: Check that "Emphasis Input Level Adjustment", "PB Y Level Adjustment" and "Y FM Carrier Frequency Adjustment" have been completed.

Adjusting method:

1) Release the protect.
   Page: 1, address: 00, data: 01
2) Record the color bar signal.
3) Playback the recorded signal.
4) Check the playback signal level (A).
   Specification:A=0.50 ± 0.025V
5) If the specification is not satisfied, change the data of page: D, address: 51, and repeat steps 2 to 4.

Playback signal level	Changing the data
When smaller than the specified value	Increase
When bigger than the specified value	Decrease

6) Press the PAUSE button of the adjusting remote control unit.

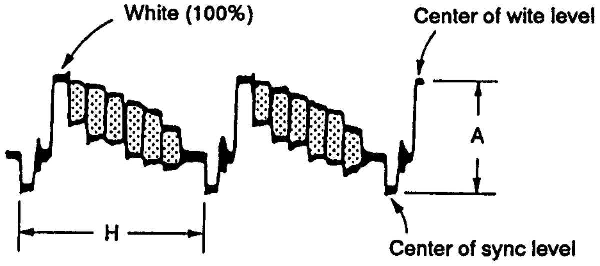


Fig. 9-17.

12. Chroma Emphasis fo Adjustment (VA-74 board)

Mode	Record
Signal	Color bar
Measurement Point	Pin ㉔ of IC203
Measuring Instrument	Oscilloscope
Adjustment Element	FL302
Specified Value	Minimum fo component

Adjusting method

1) Adjust FL203 so that the amplitude of the latter section of the chroma signal (yellow section) becomes minimum.

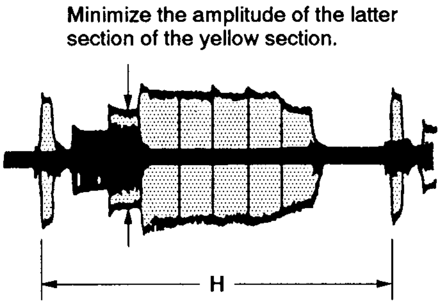

Minimize the amplitude of the latter section of the yellow section.
H

Fig. 9-18.

13. REC Y Level Adjustment (VA-74 board)

Mode	E-E
Signal	No signal
Measurement Point	Pin ⑤ of IC054
Measuring Instrument	Oscilloscope
Adjustment Page	D
Adjustment Address	55 (REC (MP)), 54 (REC Y (ME))
Specified Value	MP type tape: A=205 ± 5 mVp-p ME type tape: A=185 ± 5 mVp-p

Adjusting method:

1) Release the protect.
   Page: 1, address: 00, data: 01
2) Insert a MP type cassette tape.
3) Change the data of page: D, address: 55, and adjust so that the Y signal level (A) becomes the specified value.
4) Press the PAUSE button of the adjusting remote control unit.
5) Insert a ME type cassette tape.
6) Change the data of page: D, address: 54, and adjust so that the Y signal level (A) becames the specified value.
7) Press the PAUSE button of the remote control unit.

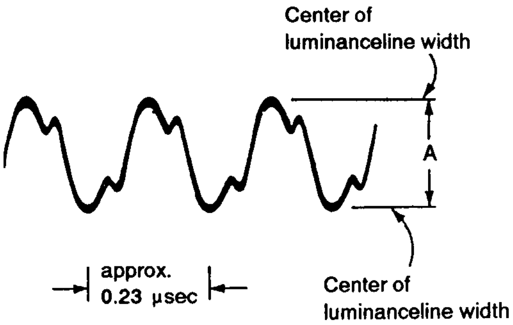

Center of luminanceline width
A
approx. 0.23 μsec
Center of luminanceline width

Fig. 9-19.

14. REC C RF Level Adjustment (VA-74 board)

Mode	E-E
Signal	Color bar
Measurement Point	Pin ③ of IC054
Measuring Instrument	Oscilloscope
Adjustment Page	D
Adjustment Address	46 (REC C RF (EE))
Specified Value	A=90 ± 10 mVp-p

Note: Use a MP type tape.

Adjusting method

1) Release the protect.
   Page: 1, address: 00, data: 01
2) Change the data of page: D, address: 46, and adjust so that the chroma signal level (A) becames the specified value.
3) Press the PAUSE button of the adjusting remote control unit.
4) Set data: 00 to page: D, address: 47, and press the PAUSE button of the adjusting remote control unit.

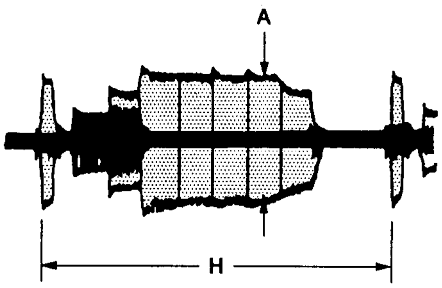


Fig. 9-20.

15. REC ATF Level Checking (CS-35 board)

Mode	Record
Signal	No signal
Measurement Point	Pin ⑱ of IC501
Measuring Instrument	Oscilloscope
Specified Value	A=600 ± 30 mVp-p

Checking method

1) Confirm that the REC ATF signal level (A) satisfies the specified value.

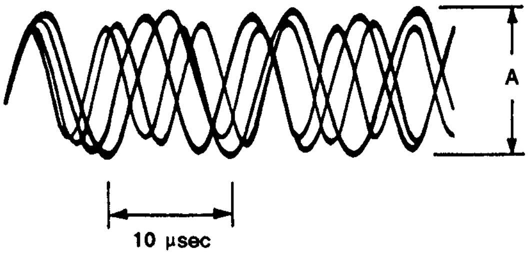


Fig. 9-21.

9-6. AUDIO SYSTEM ADJUSTMENT

- Perform the adjustment using the color bar signal as a video signal input.

[Connecting the measuring instruments for the audio]

Connect the audio system measuring instruments besides the video system measuring instruments as shown in Fig. 9-22, and perform adjustments with the power switch [video or player] position.

Set the input/output select switch to the output position in E, Australian model.

Set the HI-FI SOUND switch (PJ-47 board S552) to the following position unless specified otherwise.

- Green (stereo) position

Note: 1) When inputting the audio signal, input the same signal to both L, and R channels, unless specified otherwise.

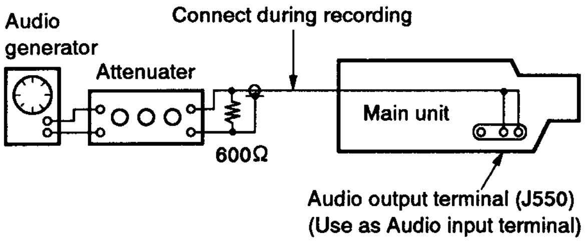
2) Be sure to insert the plug (shorting plug or dummy plug, etc.) into the audio input/output terminal (right). If the plug is not inserted, the unit will be set into the monaural mode, and correct adjustments cannot be carried out.
(Monaural mode)
During recording··REC AFM RF1.7 MHz carrier will not be output.
During playback·· The L+R signal will be output from the audio input/output terminal (left).

3) The items to be adjusted for the R channel will be indicated within the [ ], in regard to the adjusting items to be adjusted for both L and R channels.

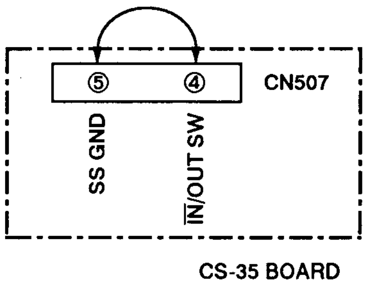
[Adjustment Procedure]

1) 1.5 MHz carrier frequency check
2) 1.7 MHz carrier frequency check
3) 1.5 MHz recording level check
4) 1.7 MHz recording level check
5) E-E output level check
6) REC matrix L–R check
7) REC matrix L+R check
8) IR adjustment
9) 1.5 MHz deviation adjustment
10) 1.7 MHz deviation adjustment
11) PB matrix L adjustment
12) PB matrix R check
13) Overall level characteristics, distortion check
14) Separation check
15) Overall noise level check

- Connect the audio generator or the attenuator as shown in the following figure.


Audio generator
Connect during recording
Attenuater
600Ω
Main unit
Audio output terminal (J550)
(Use as Audio input terminal)

Note: To use the audio output terminal as the audio input terminal, connect Pin ④ of CN507 on the CS-35 board to GND with a jumper wire. After adjusting, be sure to disconnect this wire.


⑤
④
CN507
SS GND
IN/OUT SW
CS-35 BOARD

- Connect the audio level meter or the distortion meter to the EASY connector or the Audio output terminal.

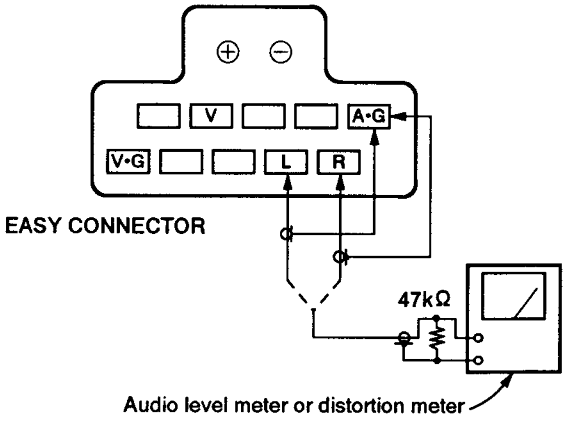

⊕ ⊖
V
A·G
V·G
L
R
EASY CONNECTOR
47kΩ
Audio level meter or distortion meter

Fig. 9-22.

1. 1.5 MHz Carrier Frequency Check (VA-74 board)

Mode	Record
Signal	No signal
Measurement Point	Pin ⑧ of IC401
Measuring Instrument	Frequency counter (Note 1)
Specified Value	1.500 ± 0.002 MHz

Note: Use a high impedance (above 1 MΩ) and low capacity (below 20 pF) probe.

Checking method:

1) Check that the 1.5 MHz carrier frequency satisfies the specified value.

2. 1.7 MHz Carrier Frequency Check (VA-74 board)

Mode	Record
Signal	No signal
Measurement Point	Pin ⑧ of IC400
Measuring Instrument	Frequency counter (Note 1)
Specified Value	1.700 ± 0.002 MHz

Note: 1) Use a high impedance (above 1 MΩ) and low capacity (below 20 pF) probe.
2) Insert a shorting plug into the audio input terminal (right).

Checking method:

1) Check that the 1.7 MHz carrier frequency satisfies the specified value.

3. 1.5 MHz Record Level Check (VA-74 board)

Mode	Record (Monaural)
Signal	No signal
Measurement Point	Pin ⑤ of CN202 (REC AFM RF)
Measuring Instrument	Oscilloscope
Specified Value	A=110 ± 12 mVp-p

Note: Do not insert the plug into the audio input terminal (right).

Checking method:

1) Check that the 1.5 MHz carrier level satisfies the specified value.
(Read the center of the luminance line width and note down the level read.)

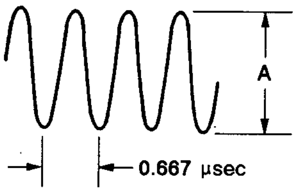


Fig. 9-23.

4. 1.7 MHz Record Level Check (VA-74 board)

Mode	Record
Signal	No signal
Measurement Point	Pin ⑤ of CN202 (REC AFM RF)
Measuring Instrument	Oscilloscope
Specified Value	A=200 ± 20 mVp-p

Note: Insert a shorting plug into the audio input terminal (right).

Checking method:

1) Check that the REC AFM RF level satisfies the specified value.

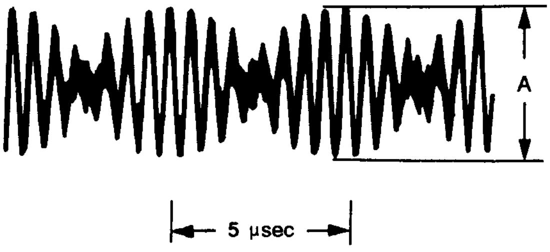


Fig. 9-24.

5. E-E Output Level Check

Mode	Record
Signal	400 Hz, –7.5 dBs audio input terminal right [left]
Measurement Point	Terminal L [R] of EASY CONNECTOR
Measuring Instrument	Oscilloscope
Specified Value	925^{+240}_{-190} mVp-p (–7.5 ± 2 dBs)

Checking method:

1) Check that the 400 Hz signal level satisfies the specified value.

6. REC Matrix L-R Adjustment (VA-74 board)

Mode	Record
Signal	400 Hz, –7.5 dBs Input to both left and right terminals of the audio input terminal
Measurement Point	Pin ③ of IC402
Measuring Instrument	Oscilloscope (Use 1:1 probe)
Adjustment Page	D
Adjustment Address	78 (REC MATRIX)
Specified Value	0 ± 5 mVp-p

Adjusting method:

1) Release the protect.
   Page: 1, address: 00, data: 01
2) Change the data of page: D, address: 78, and minimize the 400 Hz signal level.
3) Press the PAUSE button of the adjusting remote control unit.

7. REC Matrix L+R Check (VA-74 board)

Mode	Record
Signal	1. 400 Hz, –7.5 dBs: Audio input terminal left No signal: Audio input terminal right 2. No signal: Audio input terminal left 400 Hz, –7.5 dBs: Audio input terminal right
Measurement Point	Pin ㉕ of IC402
Measuring Instrument	Oscilloscope
Specified Value	The level difference is 0 ± 10 mVp-p when only the left terminal is input and when only the right terminal is input.

Note: When measuring the signal level of pin ㉕ of IC402, wait for more than 1 minute after signal input before measuring. (To stabilize the AGC)

Adjusting method:

1) Input the 400 Hz, –7.5 dBs signal only to the audio input terminal (left). (Insert the shorting plug to the audio input terminal (right).)
2) Read the 400 Hz signal level of pin ㉕ of IC402, and take it down. (Approximately 200 mVp-p)
3) Input the 400 Hz, –7.5 dBs signal only to the audio input terminal (right). (Insert the shorting plug to the audio input terminal (left).)
4) Check that the 400 Hz signal level of pin ㉕ of IC402 is (the value that was taken down at step 2) ± 10 mVp-p.

8. IR Adjustment (VA-74 board)

Mode	Playback
Signal	Alignment tape: AFM stereo For checking operations (WR5-9CS)
Measurement Point	Pins ㊹ and ⑥ of IC401 (1.5 IR) Pins ㊹ and ⑥ of IC400 (1.7 IR)
Measuring Instrument	Digital voltmeter
Adjustment Page	D
Adjustment Address	7A (1.5 IR), 7C (1.7 IR)
Specified Value	The DC voltage difference between pins ㊹ and ⑥ is 0 ± 10 mVdc

Adjusting method:

1) Release the protect.
   Page: 1, address: 00, data: 01
- 1.5 IR adjustment
2) Connect the digital voltmeter to pin ㊹ of IC401, and read the voltage. (Approximately 2100 mVdc)
3) Connect the digital voltmeter to pin ⑥ of IC401.
4) Change the data of page: D, address: 7A, and adjust so that the voltage of pin ⑥ of IC601 becomes equal to the voltage of pin ㊹. (Voltage difference below 10 mVdc)
5) Press the PAUSE button of the adjusting remote control unit.
- 1.7 IR adjustment
6) Connect the digital voltmeter to pin ㊹ of IC400, and read the voltage. (Approximately 2100 mVdc)
7) Connect the digital voltmeter to pin ⑥ of IC400.
8) Change the data of page: D, address: 7C, and adjust so that the voltage of pin ⑥ of IC400 becomes equal to the voltage of pin ㊹. (Voltage difference below 10 mVdc)
9) Press the PAUSE button of the adjusting remote control unit.

9. 1.5 MHz Deviation Adjustment

Mode	Playback
Signal	Alignment tape: For checking the operation (WR5-5CSP)
Measurement Point	Audio output terminal left or right
Measuring Instrument	Oscilloscope
Adjustment Page	D
Adjustment Address	7B (1.5 DEV)
Specified Value	-7.5 ± 0.5 dBs

Adjusting method:

1) Release the protect.
   Page: 1, address: 00, data: 01
2) Change the data of page: D, address: 7B, and adjust so that the 400 Hz signal level becomes the specified value.
3) Press the PAUSE button of the adjusting remote control unit.

10. 1.7 MHz Deviation Adjustment (VA-74 board)

Mode	Playback
Signal	Alignment tape: AFM stereo For checking operations (WR5-9CS) Bilingual (Monoscope) section
Measurement Point	1. Pin ㉗ of IC402 2. Pin ① of IC402
Measuring Instrument	Oscilloscope
Adjustment Page	D
Adjustment Address	7D (1.7 DEV)
Specified Value	8 ± 0.05 graduation

Adjusting method:

1) Release the protect.
   Page: 1, address: 00, data: 01
2) Connect the oscilloscope to pin ㉗ of IC402.
3) Adjust the 400 Hz signal amplitude to the 8.0 graduation using the VOLT/DIV knob of the oscilloscope.
4) Connect the oscilloscope to pin ① of IC402.
5) Change the data of page: D, address: 7D, and adjust so that the 1 kHz signal level becomes 8 ± 0.05 graduation. (Adjust with the center of the luminance line width.)
6) Press the PAUSE button of the adjusting remote control unit.

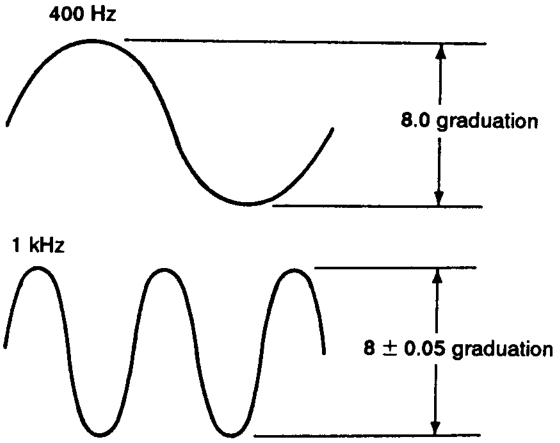


Fig. 9-25.

11. PB Matrix L Adjustment (VA-74 board)

Mode	Self recording/playback
Signal	No signal: Audio input terminal (left) 400 Hz, -7.5 dBs: Audio input terminal (right)
Measurement Point	Terminal L of EASY CONNECTOR
Measuring Instrument	Oscilloscope
Adjustment Page	D
Adjustment Address	79 (PB MATRIX)
Specified Value	Below 20 mVp-p

Adjusting method:

1) Release the protect.
   Page: 1, address: 00, data: 01
2) Input the 400 Hz, -7.5 dBs signal only to the audio input terminal (right). (Insert the shorting plug to the audio input terminal (left).)
3) Record.
4) Remove the input signal.
5) Playback the recorded section.
6) Change the data of page: D, address: 79, and minimize the cross talk component (400 Hz).
7) Press the PAUSE button of the adjusting remote control unit.

12. PB Matrix R Check (VA-74 board)

Mode	Self recording/playback
Signal	400 Hz, -7.5 dBs: Audio input terminal (left) No signal: Audio input terminal (right)
Measurement Point	Terminal R of EASY CONNECTOR
Measuring Instrument	Oscilloscope
Specified Value	Below 30 mVp-p

Checking method:

1) Input the 400 Hz, -7.5 dBs signal only to the audio input terminal (left). (Insert the shorting plug to the audio input terminal (right).)
2) Record.
3) Remove the input signal.
4) Playback the recorded section.
5) Check that the cross talk component (400 Hz) is below 30 mVp-p.

13. Overall Level Characteristic, Distortion Check

Mode	Self recording/playback
Signal	400 Hz, -7.5 dBs: Audio input terminal (left) [right] No signal: Audio input terminal (right) [left]
Measurement Point	Audio output terminal (left) [right] or Terminal L [R] of EASY CONNECTOR
Measuring Instrument	Audio level meter and distortion meter
Specified Value	Level: -7.5 ± 2 dBs Distortion rate: Below 0.8% (Note 2)

Note: 1) The [ ] indicates the measuring point during the right channel check
2) Value when the following filter is used

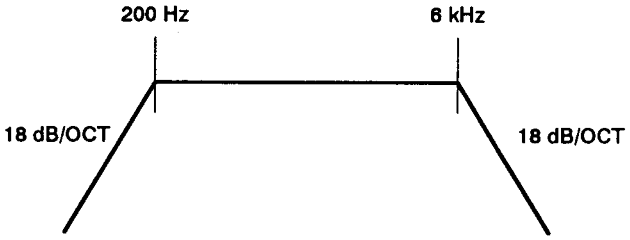


Fig. 9-26.

Checking method:

1) Input the 400 Hz, -7.5 dBs signal only to the audio input terminal (left) [right].
   Note: Be sure to insert the shorting plug to the terminal that was not signal input.
2) Record the signal.
3) Remove the input signal, and adjust the input/output switchover switch to [out].
4) Playback the recorded section.
5) Check that the 400 Hz signal level of the audio output terminal (left) [right] is -7.5 ± 2 dBs, and that the distortion rate is below 0.8% (Note 2).

14. Separation Check

Mode	Self recording /playback
Signal	No signal: Audio input terminal (left) [right] 1 kHz, –7.5 dBs: Audio input terminal (right) [left]
Measurement Point	Audio output terminal (left) [right] or Terminal L [R] of EASY CONNECTOR
Measuring Instrument	Audio level meter (Use an IHF-A curve audio correction filter)
Specified Value	Below –27.5 dBs

Note: The [ ] indicates the measuring point during the right channel check.

Checking method:

1) Insert a shorting plug into the audio input terminal (left) [right], and input a 1kHz, –7.5 dBs signal only to the audio input terminal (right) [left].
2) Record the signal.
3) Remove the input signal.
4) Playback the recorded section.
5) Check that the cross talk level (1 kHz) of the audio output terminal (left) [right] is below –27.5 dBs.

15. Overall Noise Level Check

Mode	Self recording
Signal	No signal: Audio output terminal left and right
Measurement Point	Audio output terminal (left) [right] or Terminal L [R] of EASY CONNECTOR
Measuring Instrument	Audio level meter (Use an IHF-A curve auditory correction filter)
Specified Value	Below –61.0 dBs

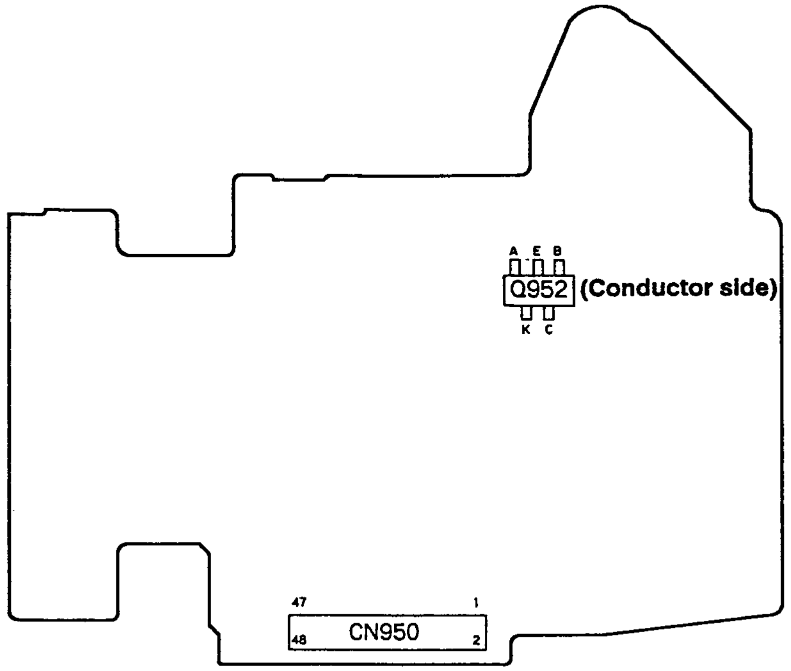
Note: The [ ] indicates the measuring point during the right channel check.

Checking method:

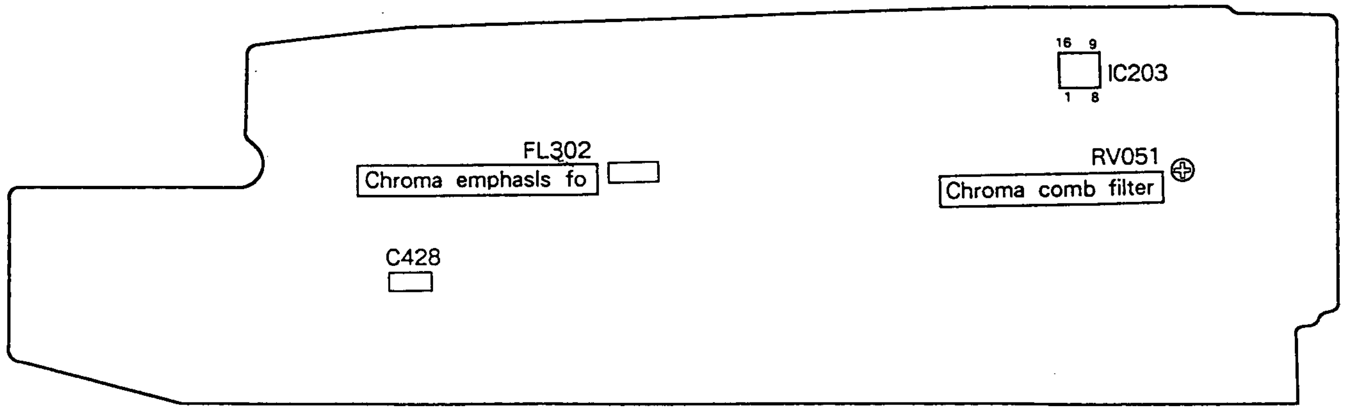
1) Insert the shorting plug to both left and right of the audio input terminals.
2) Record.
3) Remove the shorting plug.
4) Playback the recorded section.
5) Check that the noise level of the audio output terminal (left) [right] is below –61.0 dBs.

9-7. ARRANGEMENT DIAGRAM FOR ADJUSTMENT PARTS

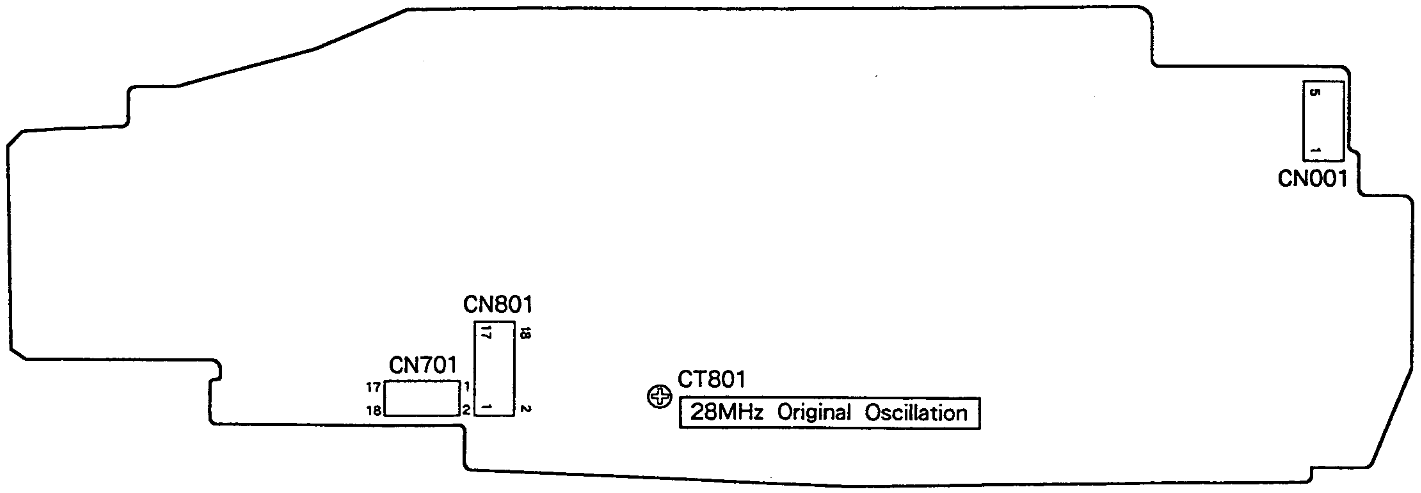
PS-300 BOARD (COMPONENT SIDE)


A E B
Q952
K C
(Conductor side)
47 1
48 CN950 2

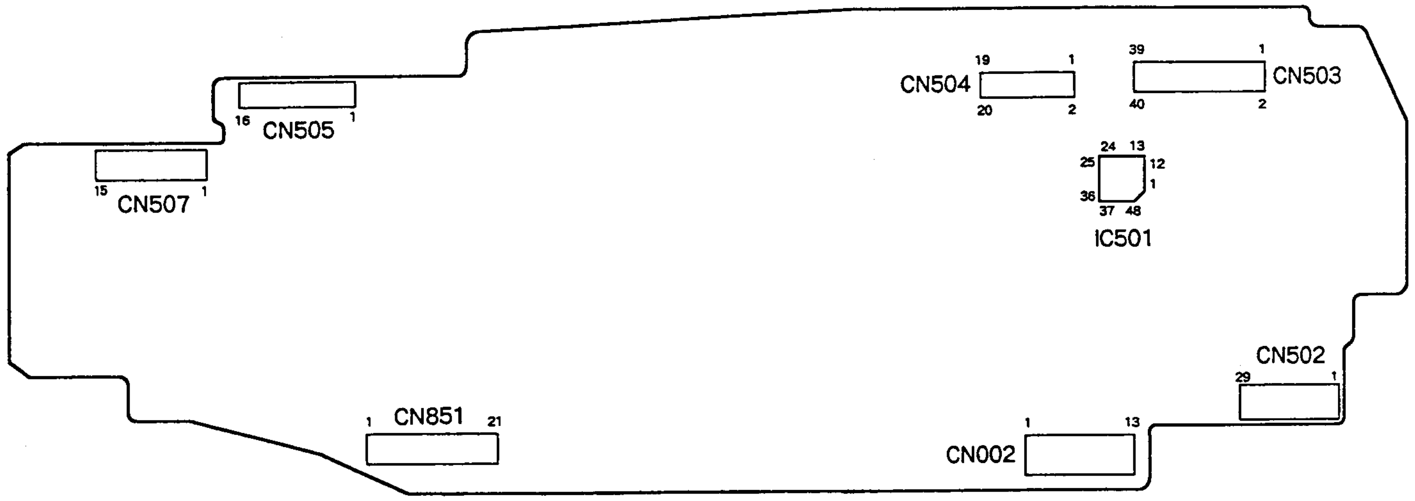
VA-74 BOARD (COMPONENT SIDE)


16 9
IC203
1 8
FL302
Chroma emphasis fo
RV051
Chroma comb filter
C428

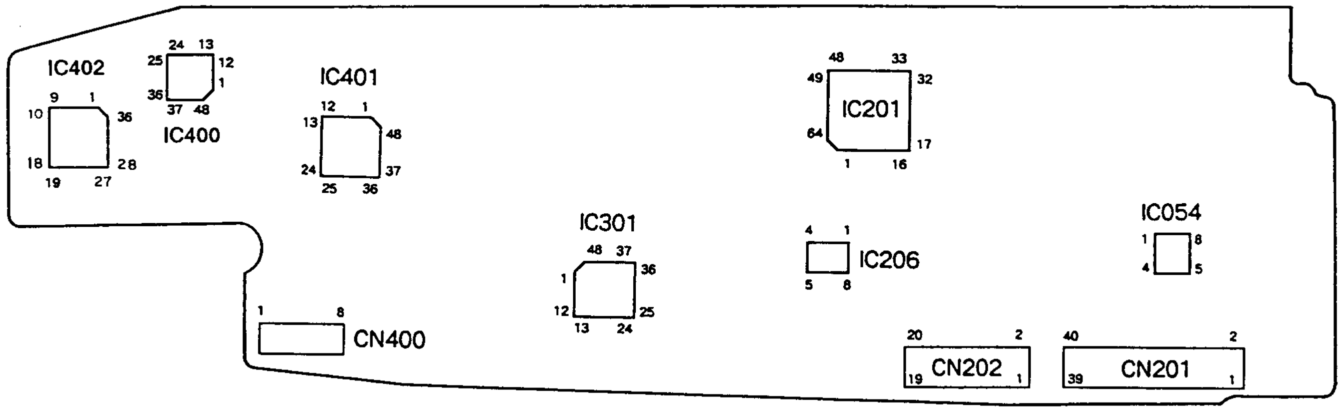
CS-35 BOARD (COMPONENT SIDE)


5
1
CN001
CN801
17 18
1 2
CN701
17 1
18 2
CT801
28MHz Original Oscillation

CS-35 BOARD (CONDUCTOR SIDE)


CN504
19 1
20 2
39 1
40 2
CN503
16 CN505 1
15 CN507 1
24 13
25 12
36 1
37 48
IC501
CN502
29 1
1 CN851 21
1 13
CN002

VA-74 BOARD (CONDUCTOR SIDE)


IC402
9 1
10 36
18 28
19 27
24 13
25 12
36 1
37 48
IC400
IC401
12 1
13 48
24 37
25 36
48 33
49 32
IC201
64 17
1 16
IC301
48 37
1 36
12 25
13 24
4 1
IC206
5 8
IC054
1 8
4 5
1 8
CN400
20 2
19 CN202 1
40 2
39 CN201 1

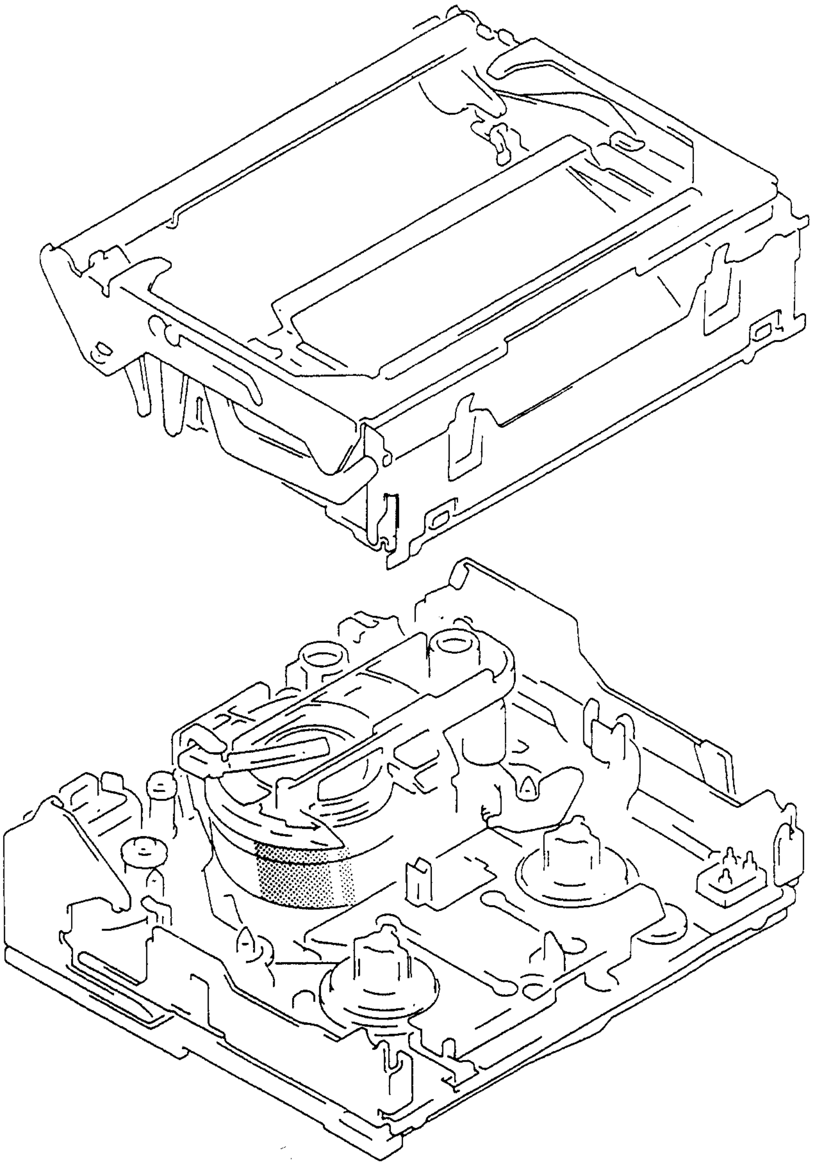
8 mm Video MECHANICAL ADJUSTMENT MANUAL Ⅳ

V12995

A MECHANISM

Video 8

File with the SERVICE MANUAL



8 VIDEO RECORDER

SONY®

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1. PREPARATION FOR MECHANICAL CHECK, ADJUSTMENT AND REPLACEMENT

For removal of the cabinet and boards, refer to "Disassembly" in each Service Manual.
Mechanical adjustment is done in the $\boxed{\text{USE}}$ mode. (To select the $\boxed{\text{USE}}$ mode, refer to "1-3, Handling of Mode Selector".)

1-1. CASSETTE COMPARTMENT ASSEMBLY

1. Removal (Fig. 1)

1) Select the $\boxed{\text{USE}}$ mode.
2) Push the part ⓐ of lock arm ❶ toward the arrow 🅐 to unlock from lock guide ❷, and raise the cassette compartment as shown in Fig. a.
3) Remove two screws ❸ and remove the LS frame ❹ toward the arrow 🅑.
4) With the cassette compartment assembly ❺ pushed in arrow 🅒 direction, distort tabs ⓑ and ⓒ of MD side plate toward the arrow 🅓 to disengage from catches ⓓ and ⓔ of cassette compartment assembly respectively.
   In such a case, insert a screwdriver between MD side plate and catch and disengage the tab ⓑ first, then disengage the tab ⓒ for easy removal as shown in Fig. b.
5) Raise the cassette compartment assembly ❺ in the opposite direction of arrow 🅒 until the shafts ⓕ and ⓖ are disengaged, and push left and right side plates toward arrow 🅓 to remove the cassette compartment assembly.

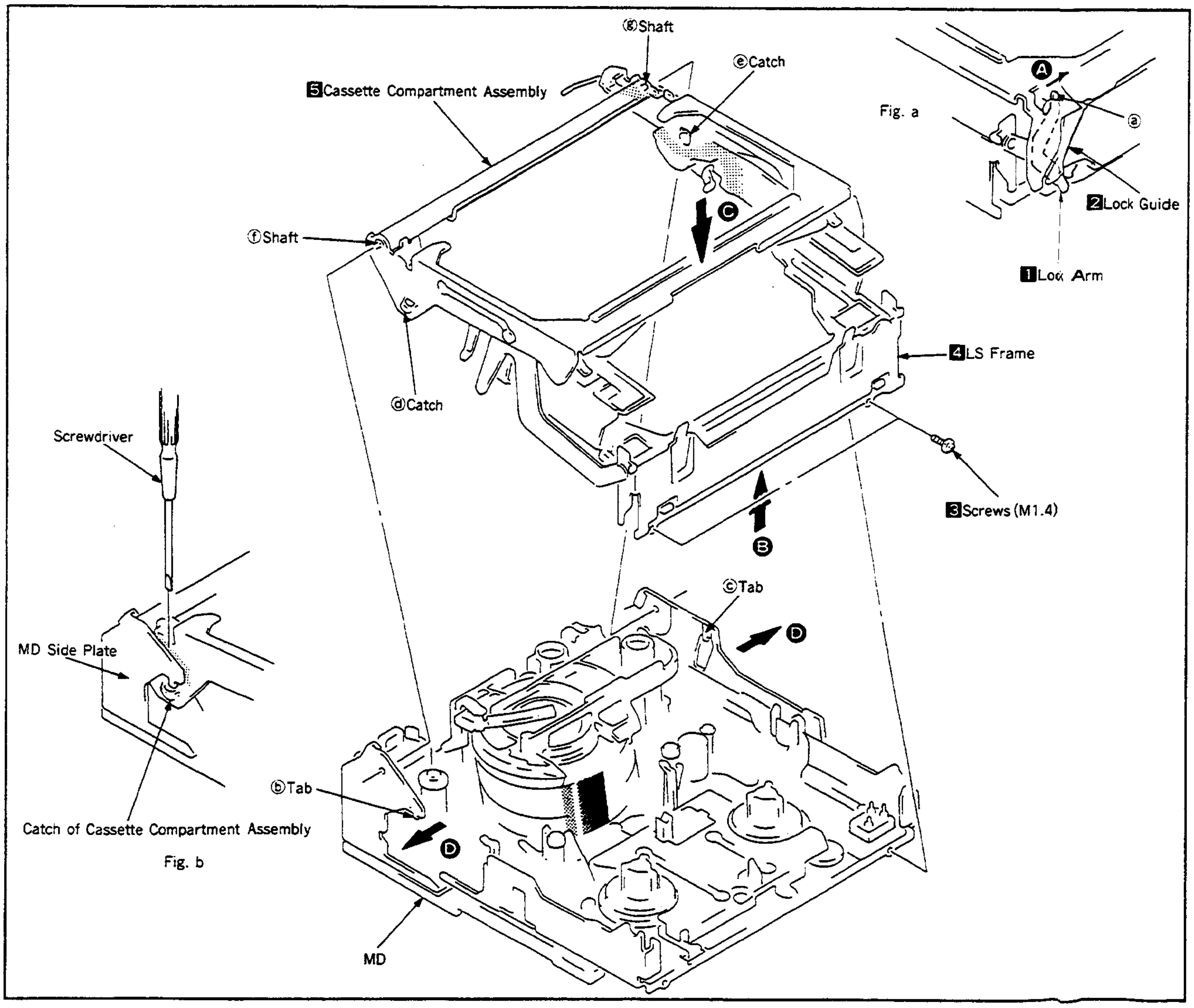

ⓖShaft
ⓔCatch
❺Cassette Compartment Assembly
Fig. a
🅐
ⓐ
❷Lock Guide
❶Lock Arm
ⓕShaft
🅒
❹LS Frame
ⓓCatch
Screwdriver
❸Screws (M1.4)
🅑
ⓒTab
🅓
MD Side Plate
ⓑTab
Catch of Cassette Compartment Assembly
Fig. b
🅓
MD

Fig. 1

2. Mounting (Fig. 2)

1) Select the USE mode.
2) Draw the cassette holder **6** of cassette compartment assembly **5** toward the arrow 🅔, and lower the LS frame **4** toward the arrow 🅕.
3) With the cassette compartment assembly **5** tilted by about 45° against MD, insert shafts ⓕ and ⓖ of cassette compartment assembly into holes ⓗ and ⓘ of MD side plate respectively.
   At this time, the part ⓙ of torsion bar must be positioned on the side ⓚ of LS flexible board (FP-443) (not on the side ⓛ), as shown in Fig. c.
4) Holding holes ⓗ and ⓘ of MD side plate, press the cassette compartment assembly **5** so that its catches ⓓ and ⓔ are engaged with tabs ⓑ and ⓒ of MD side plate. In such a case, the lock arm **1** of cassette compartment assembly must be inserted into a groove in the guide rail **7** on the MD side plate as shown in Fig. d.
5) Insert left and right side plates ⓜ and ⓝ of LS frame **4** inside the LS chassis **8**.
6) Push down the cassette compartment to lock.

Note : Make sure that the shafts ⓕ, ⓖ and the tabs ⓞ, ⓟ are set in the MD side plate properly.

7) Tighten two screws **3**.

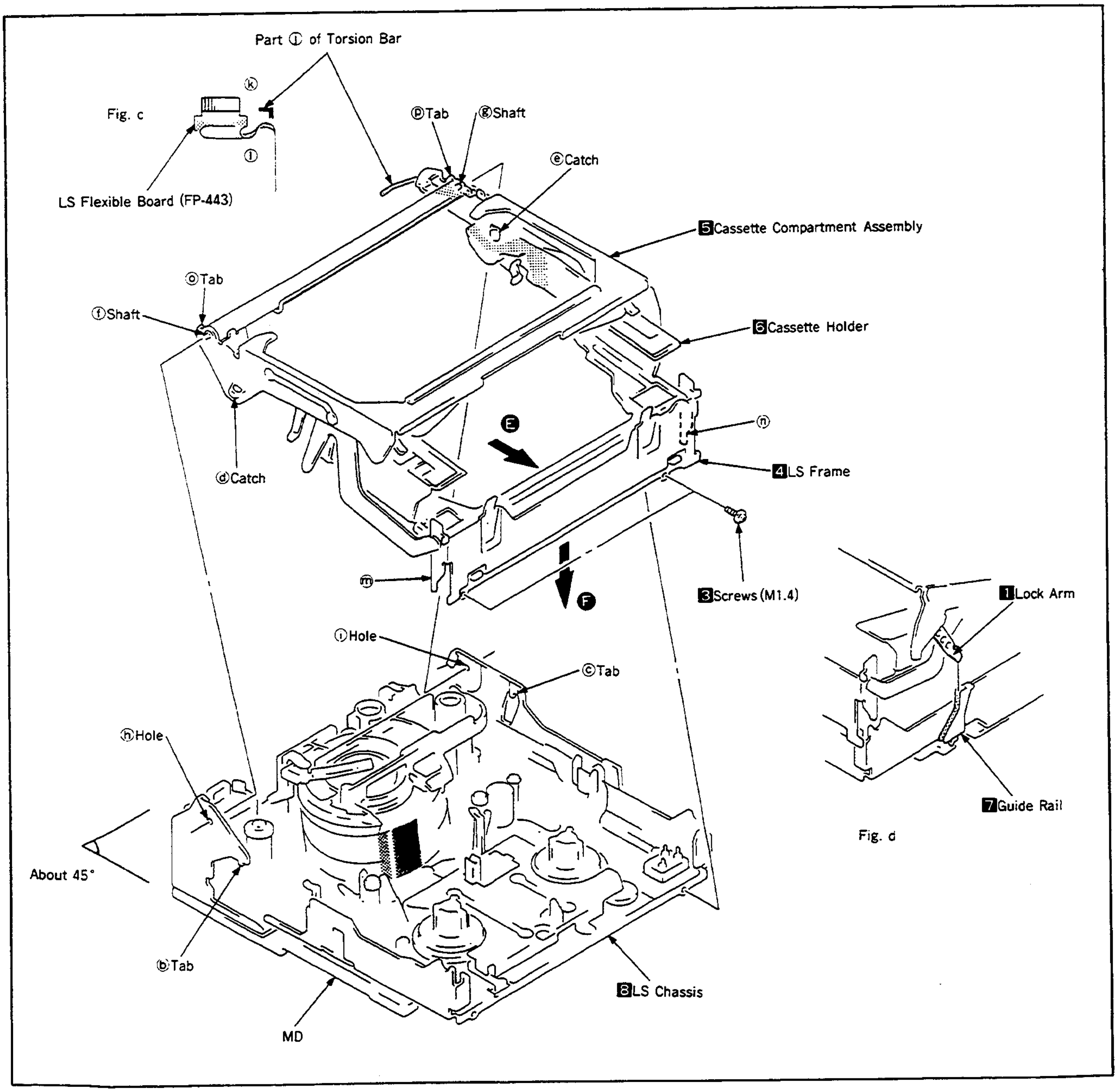

Part ⓙ of Torsion Bar
ⓚ
Fig. c
ⓛ
LS Flexible Board (FP-443)
ⓟTab
ⓖShaft
ⓔCatch
5 Cassette Compartment Assembly
ⓞTab
ⓕShaft
6 Cassette Holder
ⓓCatch
🅔
ⓝ
4 LS Frame
ⓜ
🅕
3 Screws (M1.4)
1 Lock Arm
ⓘHole
ⓒTab
ⓗHole
About 45°
7 Guide Rail
Fig. d
ⓑTab
8 LS Chassis
MD

Fig. 2

1-2. OPERATION WITH CASSETTE COMPARTMENT ASSEMBLY REMOVED (Fig. 3)

1) Referring to the Service Manual, supply power with the cabinet and camera removed. (Make the mechanical deck ready to operate.)
2) Place the cap ❷ on the Reflector C ❶.
3) Press the pin of the push switch ❸ (ON state) and fix it with adhesive tape ❹ in that state.

Note : Press the asterisked (✱) pin to set the REC mode.
(This is not required for the other modes.)

4) Push the cassette compartment DOWN switch ❺ in an arrow direction as shown in Fig. a.

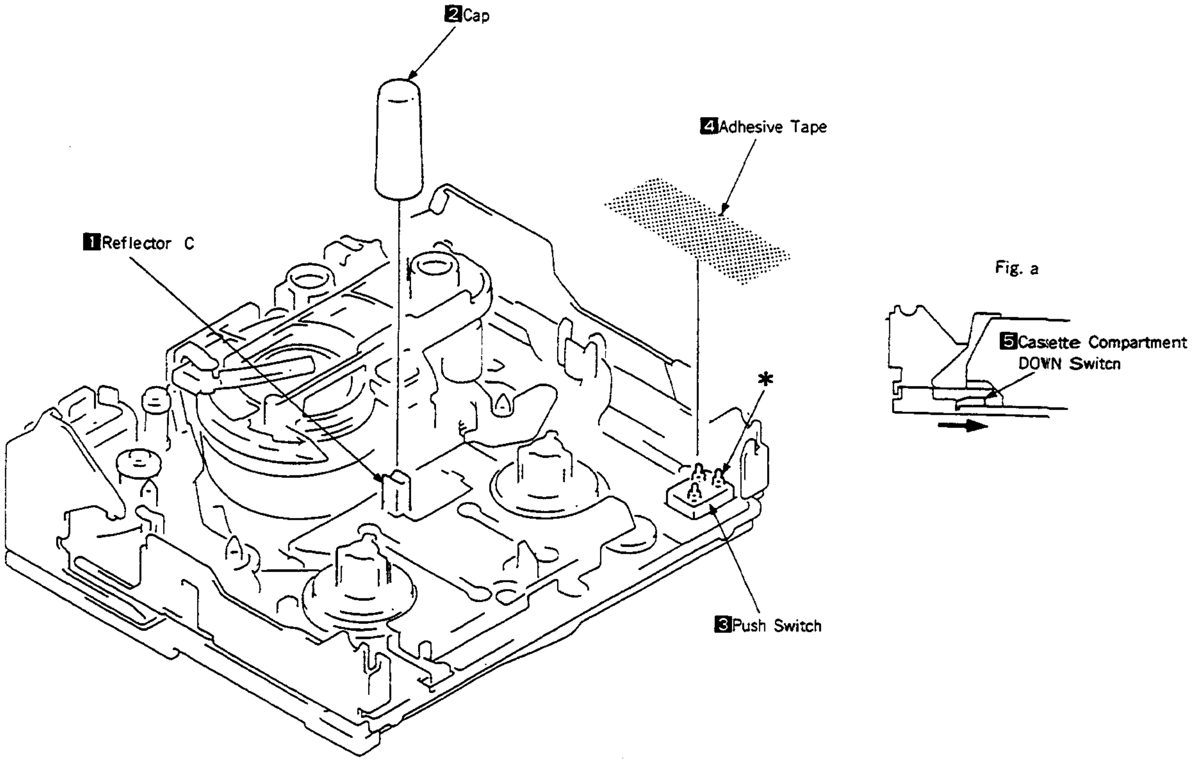

❷Cap
❹Adhesive Tape
❶Reflector C
Fig. a
❺Cassette Compartment
DOWN Switch
*
❸Push Switch

Fig. 3

1-3. HANDLING OF MODE SELECTOR

- Stick the MD process table label to the mode selector IV panel, then mount the panel on the mode selector. U,U', FL, O, O' and A mechanisms have different mode indications respectively. Select your disired type. (Fig.4)

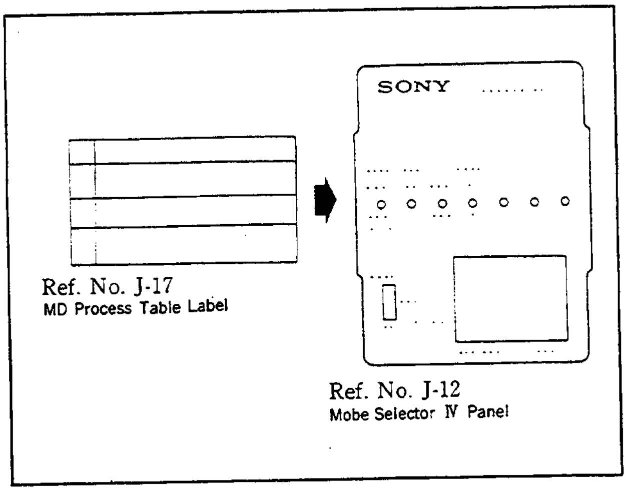

SONY
Ref. No. J-17
MD Process Table Label
Ref. No. J-12
Mobe Selector Ⅳ Panel

Fig. 4

1 Construction (Fig.5)

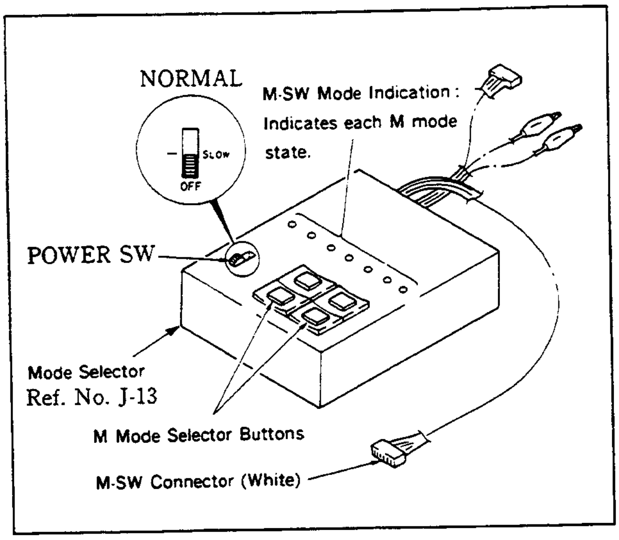

NORMAL
SLOW
OFF
M-SW Mode Indication :
Indicates each M mode
state.
POWER SW
Mode Selector
Ref. No. J-13
M Mode Selector Buttons
M-SW Connector (White)

Fig. 5

2 Connection (Fig.6)

For CCD-FX410 series

1) Insert the FP-425 flexible connector 1 and M-SW connector 2 into the mode selector IV conversion connector 3 respectively.

3. Handling

1) Use the M mode selector buttons only.
2) During mode selection, "BLANK" lights up when no mode is being selected.
3) If the right M mode selector button is kept pressed, END, EJECT, USE, LOAD, READY,TURN, REC and FF light up in that order.
4) When changing over from the FF mode back to the END mode, press the left M mode selector botton to select your desired mode.

For CCD-FX410 series

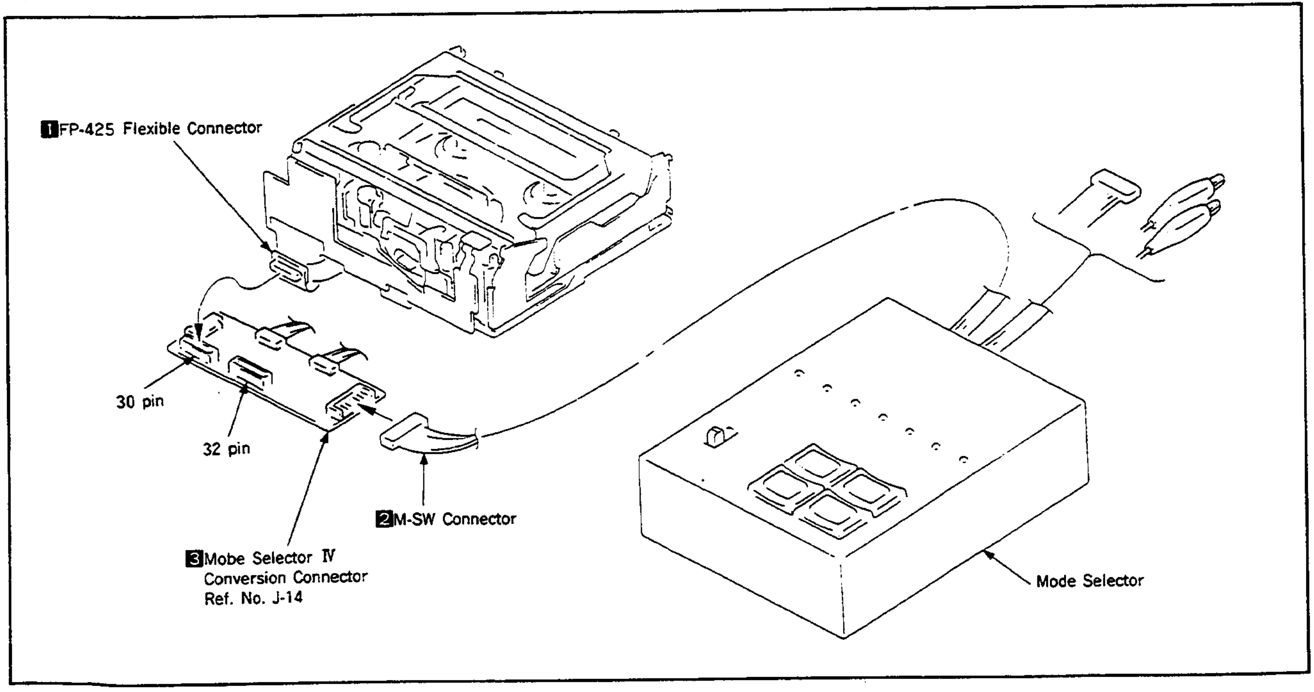
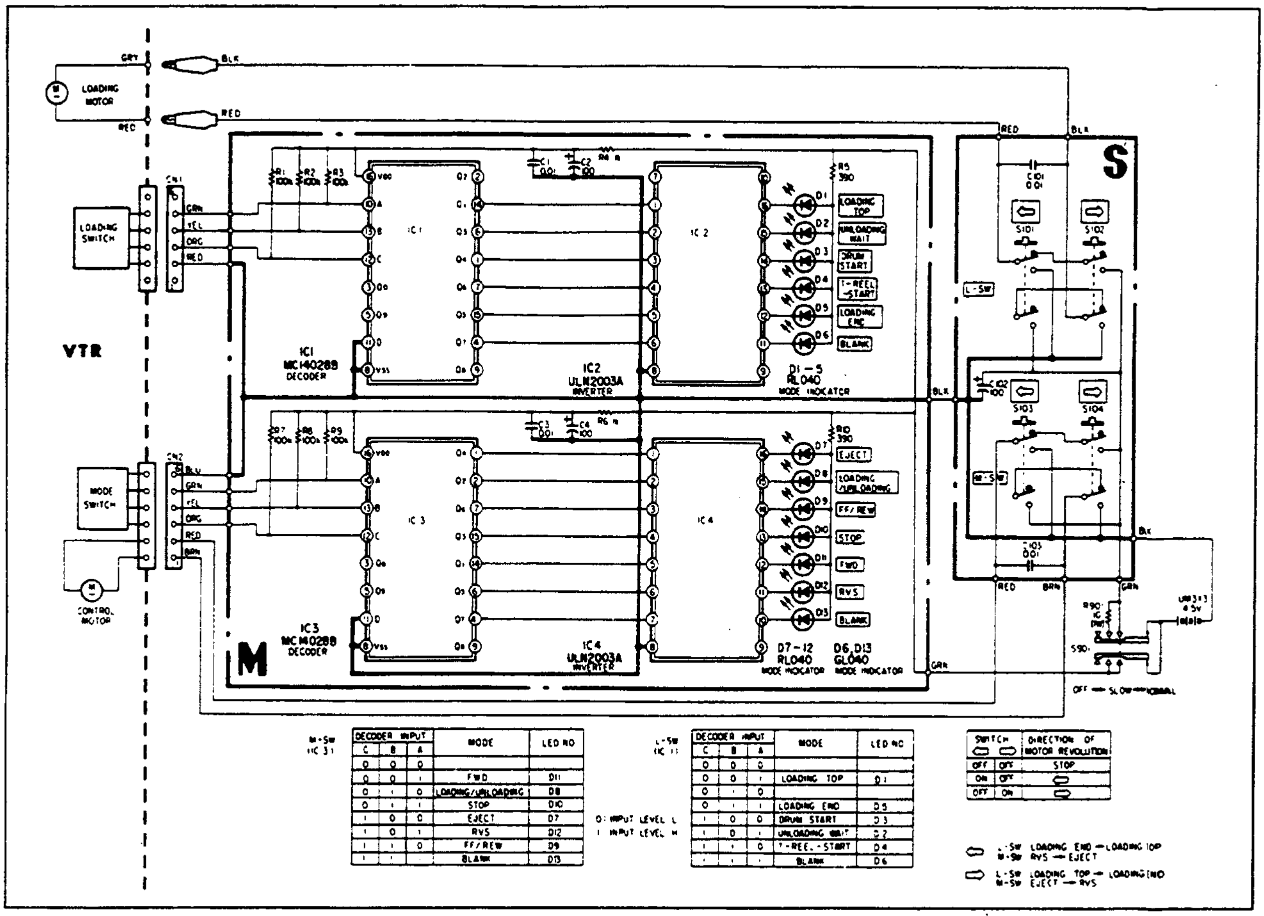

1 FP-425 Flexible Connector
30 pin
32 pin
2 M-SW Connector
3 Mobe Selector Ⅳ
Conversion Connector
Ref. No. J-14
Mode Selector

Fig. 6

1-4. MODE SELECTOR SCHEMATIC DIAGRAM


LOADING MOTOR
GRY
BLK
RED
VTR
LOADING SWITCH
CN1
GRN
YEL
ORG
RED
MODE SWITCH
CN2
BLU
BRN
CONTROL MOTOR
IC1 MC14028B DECODER
IC2 ULN2003A INVERTER
IC3 MC14028B DECODER
IC4 ULN2003A INVERTER
D1-5 RL040 MODE INDICATOR
D7-12 RL040 MODE INDICATOR
D6, D13 GL040 MODE INDICATOR
LOADING TOP
UNLOADING WAIT
DRUM START
T-REEL START
LOADING END
BLANK
EJECT
LOADING /UNLOADING
FF/REW
STOP
FWD
RVS
S101
S102
S103
S104
L-SW
M-SW
C101 0.01
C102 100
C103 0.01
R901
S901
OFF — SLOW — NORMAL
S
M

M-SW (IC 3)

DECODER INPUT			MODE	LED NO
C	B	A		
0	0	0		
0	0	1	FWD	D11
0	1	0	LOADING/UNLOADING	D8
0	1	1	STOP	D10
1	0	0	EJECT	D7
1	0	1	RVS	D12
1	1	0	FF/REW	D9
1	1	1	BLANK	D13

0: INPUT LEVEL L
1: INPUT LEVEL H

L-SW (IC 1)

DECODER INPUT			MODE	LED NO
C	B	A		
0	0	0		
0	0	1	LOADING TOP	D1
0	1	0		
0	1	1	LOADING END	D5
1	0	0	DRUM START	D3
1	0	1	UNLOADING WAIT	D2
1	1	0	T-REEL-START	D4
1	1	1	BLANK	D6

SWITCH ⇦	SWITCH ⇨	DIRECTION OF MOTOR REVOLUTION
OFF	OFF	STOP
ON	OFF	⇦
OFF	ON	⇨

⇦ L-SW LOADING END → LOADING TOP
M-SW RVS → EJECT

⇨ L-SW LOADING TOP → LOADING END
M-SW EJECT → RVS

1-5. MODE SELECTOR PARTS LIST

CAPACITOR

Ref. No	Part No.	Description		
C1	1-108-579-00	MILER	0.01μF	50V
C2	1-123-333-00	ELECT	100μF	24V
C3	1-108-579-00	MILER	0.01μF	50V
C4	1-123-333-00	ELECT	100μF	24V
C101	1-108-579-00	MILER	0.01μF	50V
C102	1-123-333-00	ELECT	100μF	24V
C103	1-108-579-00	MILER	0.01μF	50V

DIODE

Ref. No	Part No.	Description
D1	8-719-812-31	DIODE TLR123
D2	8-719-812-31	DIODE TLR123
D3	8-719-812-31	DIODE TLR123
D4	8-719-812-31	DIODE TLR123
D5	8-719-812-31	DIODE TLR123
D6	8-719-812-33	DIODE TLG123A
D7	8-719-812-31	DIODE TLR123
D8	8-719-812-31	DIODE TLR123
D9	8-719-812-31	DIODE TLR123
D10	8-719-812-31	DIODE TLR123
D11	8-719-812-31	DIODE TLR123
D12	8-719-812-31	DIODE TLR123
D13	8-719-812-33	DIODE TLG123A

IC

Ref. No	Part No.	Description
IC1	8-752-240-28	IC TC4028BP
IC2	8-752-120-03	IC μPA2003C
IC3	8-759-240-28	IC TC4028BP
IC4	8-759-120-03	IC μPA2003C

RESISTOR

Ref. No	Part No.	Description		
R1	1-247-179-00	CARBON	100K	1/4W
R2	1-247-179-00	CARBON	100K	1/4W
R3	1-247-179-00	CARBON	100K	1/4W
R4	1-247-131-00	CARBON	1K	1/4W
R5	1-247-121-00	CARBON	390	1/4W
R6	1-247-131-00	CARBON	1K	1/4W
R7	1-247-179-00	CARBON	100K	1/4W
R8	1-247-179-00	CARBON	100K	1/4W
R9	1-247-179-00	CARBON	100K	1/4W
R10	1-247-121-00	CARBON	390	1/4W
R901	1-214-594-00	METAL	10	1W

2. PERIODIC CHECK AND MAINTENANCE

- Carry out the following maintenance and periodic checks in order not only to fully exhibit the functions and performance of the set, but also for the equipment and tape. After repairing, service the set as follows, regarless of the length of use.

2-1. CLEANING OF ROTARY DRUM ASSEMBLY

1) Gently apply chamois cloth (Ref. No. J-2) soaked in cleaning liquif (Ref. No.J-1) to the rotary drum assembly.
   Clean it by rotating the upper rotary drum assembly slowly counterclockwise by hand.

Note : Do not rotate the motor by power or rotate the upper rotary drum assembly clockwise by hand. Also, the head tip is highly likely to be damaged if the chamois cloth is moved in a pependicular direction to the it. make sure to follow the instructions above for cleaning the rotarydrum assembly.

2-2. CLEANING OF TAPE PATH (Fig.7)

1) In the USE mode, clean the tape running system (TG - 1,- 2,- 3,- 4,- 5, - 6, - 7, pinch roller, and capstan shaft) and the lower drum, using a super fine applicator (Ref. No. J - 3) soaked in the cleaning liquid.

Note : Note that no oil or grease of each link mechanism adheres to the super fine applicator (Ref. No. J - 3).

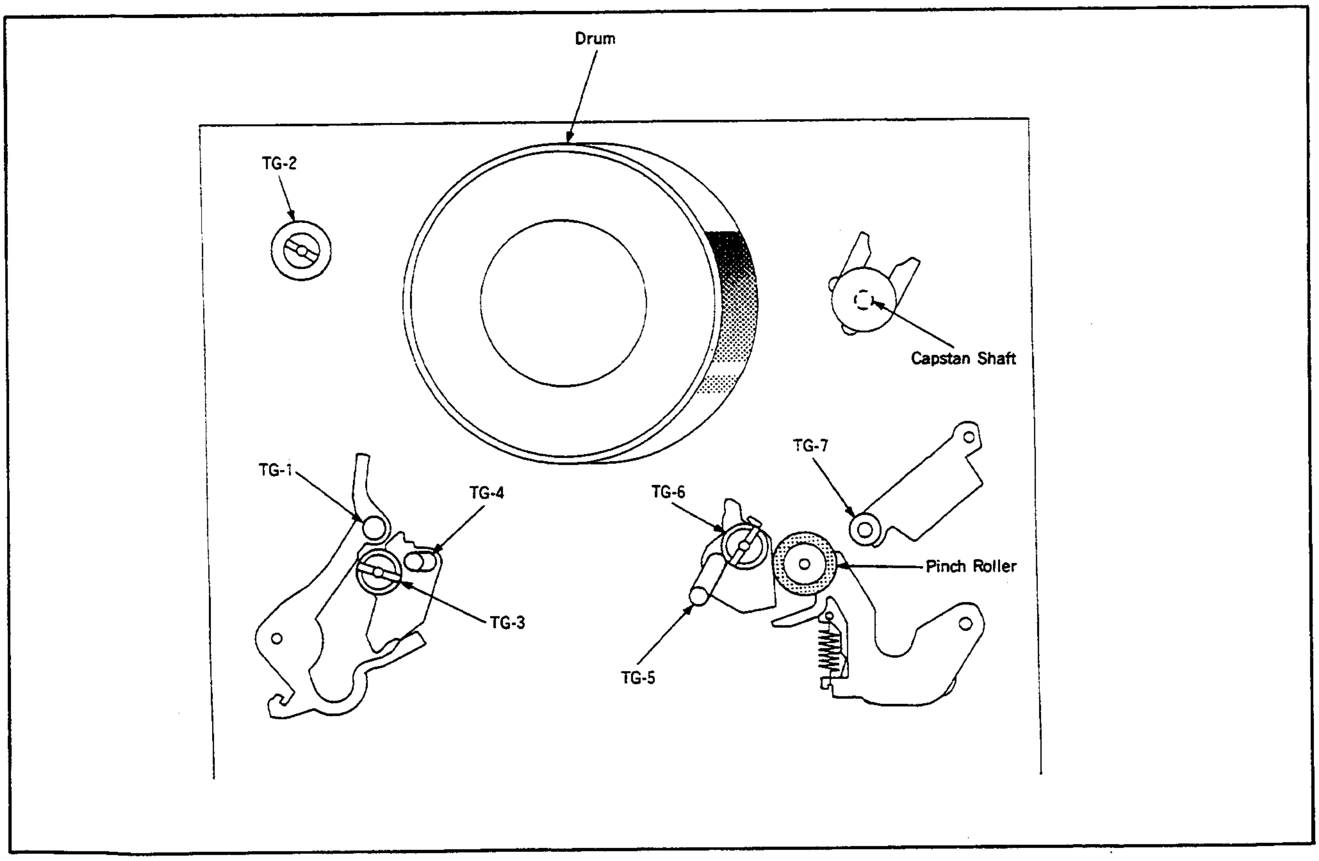


Fig. 7

2-3. PERILDIC CHECK ITEMS

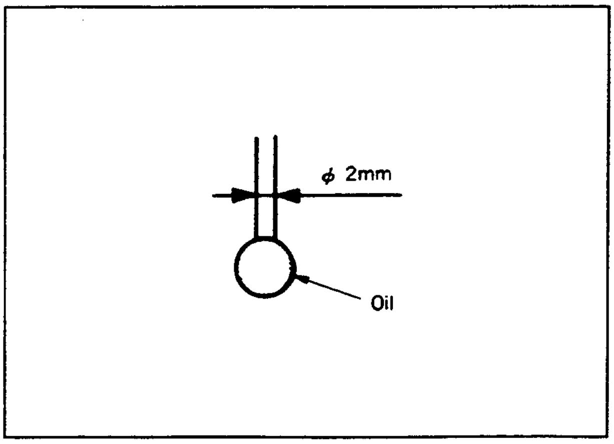
	Location of Maintenance and check	Hours of Use (H)										Remarks
		500	1000	1500	2000	2500	3000	3500	4000	4500	5000	
Tape transportion System	Cleaning of tape path surface	○	○	○	○	○	○	○	○	○	○	Be careful of oil
	Cleaning and degaussing of rotary assembly	○	○	○	○	○	○	○	○	○	○	Be careful of oil
Driving System	Relay belt	—	☆	—	☆	—	☆	—	☆	—	☆	3-944-539-01
	Capstan shaft	—	◎	—	◎	—	◎	—	◎	—	◎	Be adsolutely careful not to get oil on the tape path surface.
	Relay pulley shaft	—	◎	—	◎	—	◎	—	◎	—	◎	
	Loading motor	—	☆	—	☆	—	☆	—	☆	—	☆	A-7040-304-A
Performance Confirmation	Abnormal noise	☆	☆	☆	☆	☆	☆	☆	☆	☆	☆	
	Back tension measurement	—	☆	—	☆	—	☆	—	☆	—	☆	
	Brake system	—	☆	—	☆	—	☆	—	☆	—	☆	
	FWD. RVS torque measurement	—	☆	—	☆	—	☆	—	☆	—	☆	

○ : Cleaning ◎ : Oil ☆ : Confirmation

Note : When overhauling, refer to the items above to replace parts.

Note : Concerning oil

- Be sure to use specified oil. (If you use oil with different visicosity, etc., it may cause troubles.)
  Oil : Part No. 7-661-018-18 (Mitsubishi Diamond Oil Hydrofluid NT - 68)
- When lubricating bearings, be sure use oil free from dust, etc. (If you use oil with dust, etc. contained, it may cause bearings to be worn out or seized.)
- A drip of oil refers to an amount attached to the tip of a φ 2mm stick shown in the right figure.

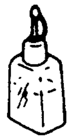


2-4. Service jigs list

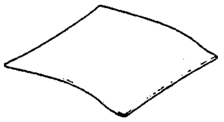
Ref. No.	Name	Part No.	Fixture No.	Usage and Others
J-1	Cleaning fluid	Y-2031-001-0		
J-2	Chamois cloth	2-034-697-00		
J-3	Super fine applicator (Made by NIPPON APPLICATOR, P752D)			
J-4	Head degausser	Widely available		
J-5	Small mirror for adjustment Spare mirror	J-6080-029-A J-6080-030-1	SL-5052	Tape path
J-6	Alignment tape NTSC (WR5-1N) PAL (WR5-1C)	8-967-995-01 8-967-995-06		Tape path
J-9	FWD and RVS winding torque cassette	J-6080-824-A	GD-2086	
J-10	Rotary drum jig	(Attached to the maintenance rotary upper drum)		
J-11	Screwdriver for tape path	J-6082-026-A		For tape guide adjustment
J-12	Mode selector Ⅳ panel	J-6082-105-A		
J-13	Mode selector	J-6080-825-A		For all models
J-14	Mode selector Ⅳ conversion connector	J-6082-167-A		
J-15	FWD B.T. adjusting driver	J-6082-182-A		
J-16	Adjusting remote controller	J-6082-053-B		Tape path (Setting of PATH mode)
J-17	MD process table label	J-6082-166-A		

Other equipment ● Oscilloscope
● Analog tester (20 kΩ)

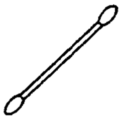
J-1



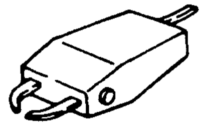
J-2



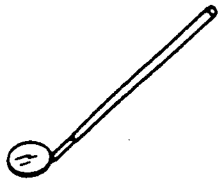
J-3



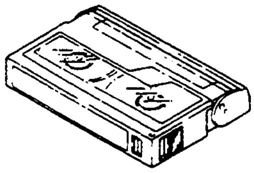
J-4



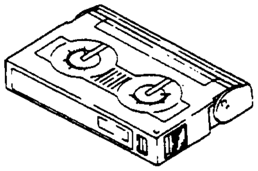
J-5



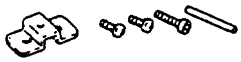
J-6



J-9

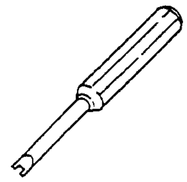


J-10

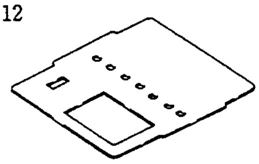


(Attached to the maintenance rotary upper drum)

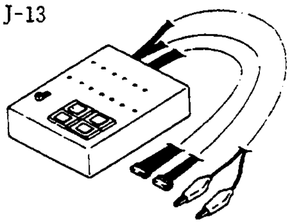
J-11



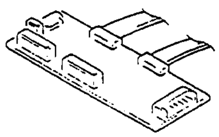
J-12



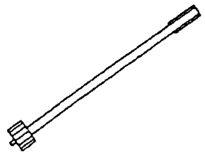
J-13



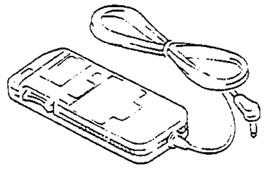
J-14



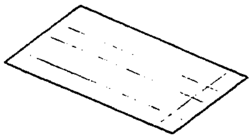
J-15



J-16



J-17



3. MECHANICAL CHECK, ADJUSTMENT AND REPLACEMENT

Note : Use the mode selector (Ref. No. J-13) for the following mechanical checks, adjustments and replacements.

Note : The modes in ☐ are those set by pressing the mode selector buttons.

3-1. RETAINER, GOOSENECK ASSEMBLY (Fig. 8)

1. Removal

1) Referring to 1-1, remove the cassette compartment assembly.
2) Remove a screw ❶.
3) Remove the Retainer, Gooseneck assembly ❷.

2. Mounting

1) Mount the Retainer, Gooseneck assembly ❷ with its two tabs and holes of LS chassis engaged with its hole and a boss of LS chassis.
2) Tighten the screw ❶.
3) Referring to 1-1, mount the cassette compartment assembly.

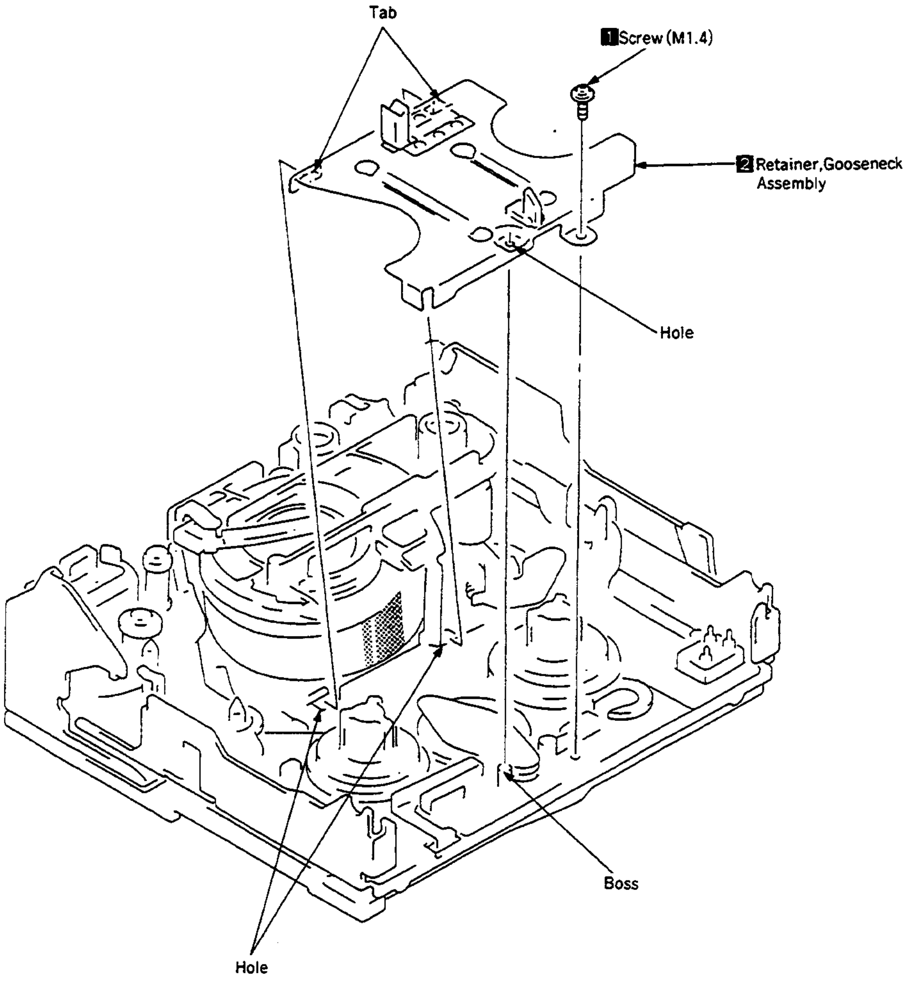


Fig. 8

3-2. PROTECTOR BASE ASSEMBLY (Fig. 9)

1. Removal

1) Referring to 1-1, remove the cassette compartment assembly.
2) Remove two screws 1, then the protector base assembly 2.

2. Mounting

1) Mount the protector base assembly 2 with its three hole engaged with two dowels of mechanical chassis, and a dowel of TG-5 Base Holder 3.
2) Tighten two screws 1.
3) Referring to 1-1, mount the cassette compartment assembly.

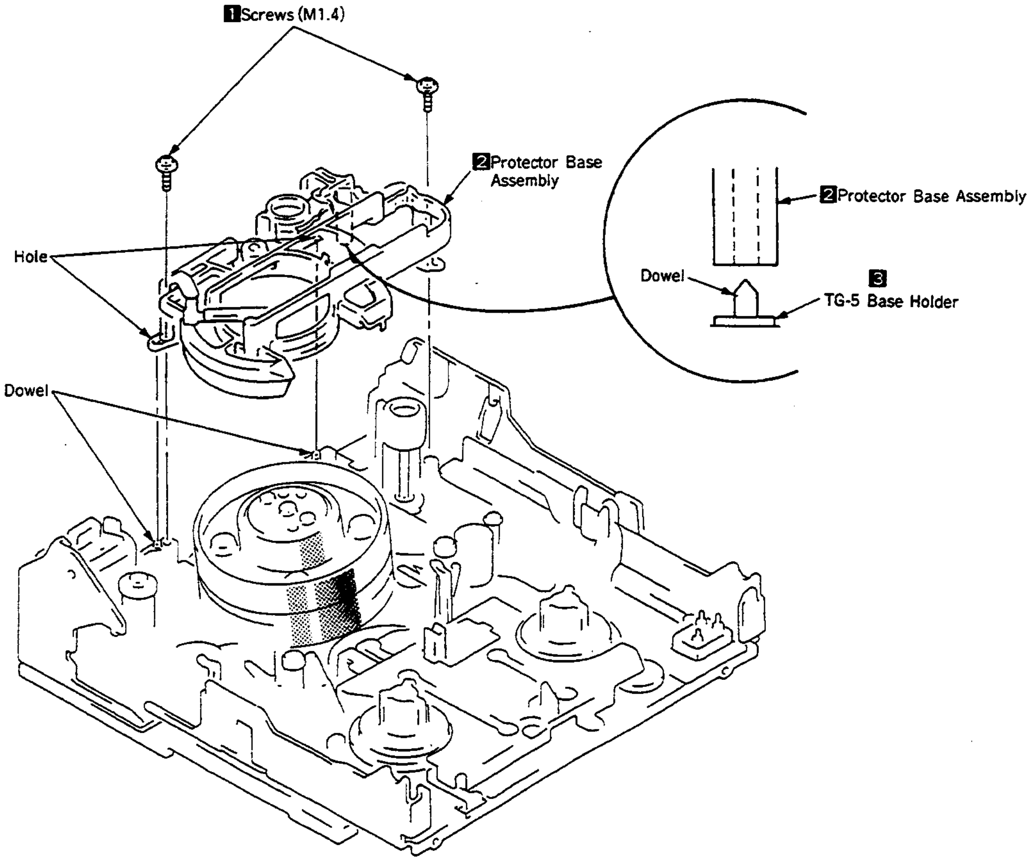

1 Screws (M1.4)
2 Protector Base Assembly
Hole
Dowel
2 Protector Base Assembly
Dowel
3 TG-5 Base Holder

Fig. 9

3-3. DRUM ASSEMBLY (Fig. 10)

1. Removal

1) Referring to 1-1, remove the cassette compartment assembly.
2) Referring to 3-2, remove the protect base assembly.
3) Disconnect the connector of FP-444 flexible board ❶ on the back of MD.
4) Remove three screw ❷, then the drum assembly ❸.

Note : Do not touch the outer surfaced of drum (hold portions Ⓐ and Ⓑ of drum).

2. Mounting

1) Mount the drum assembly ❸ while aligning with two dowels ⓐ of chassis.

Note : Do not touch the outer surfaced of drum (hold portions Ⓐ and Ⓑ of drum).

2) Tighten three screw assemblies ❷ in the order of 1, 2 and 3.

Note : Tighten lightly not to deform the drum lead.

3) Apply a screw locking agent to prevent screws ftom loosening.

Note : In tightening the screws, pushing down the drum extremely will allow the drum to float up.

4) Connect the connector of FP-444 flexible board ❶ on the back of MD.
5) Referring to 3-2, mount the protect base assembly.
6) Referring to 1-1, mount the cassette compartment assembly.

Note : After mounting, make tape path adjustment in Section 4.

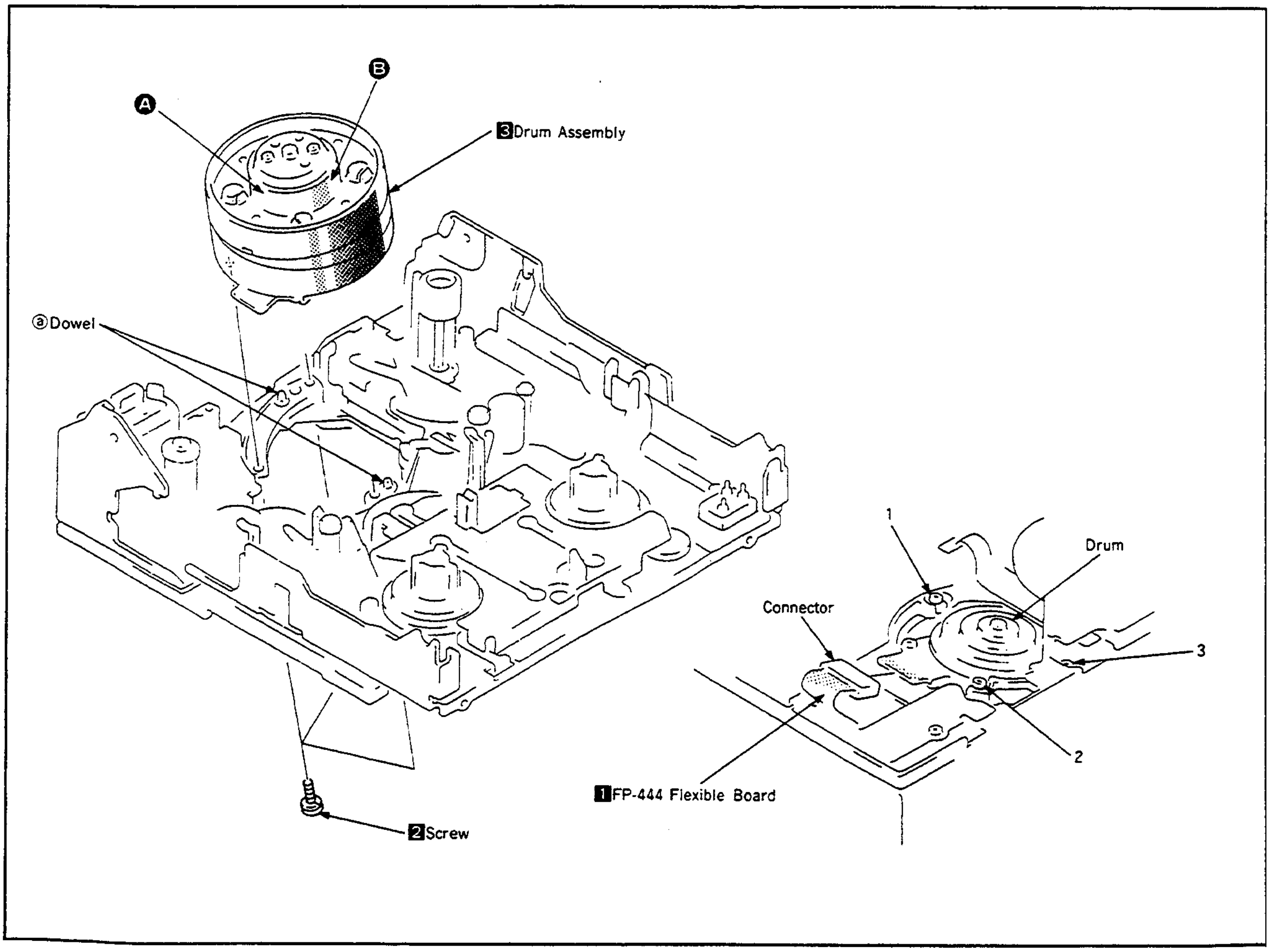


Fig. 10

3-4. CAPSTAN MOTOR ASSEMBLY (Fig. 11)

1. Removal

1) Referring to 1-1, remove the cassette compartment assembly.
2) Remove two screw 1, then the capstan cover 2.
3) Remove the screw 3, then the capstan motor assembly 4.

2. Mounting

1) Mount the capstan motor assembly 4 and tighten the scre 3.

Note : In mounting the capstan motor assembly, hold lightly the capstan motor assembly until the rotor gear aligns with the change gear Assy, then insert fully the assembly when both gears are engaged completely by manually rotating the rotor. (Take care not to damage the change gear Assy.)

2) Mount the capstan cover 2 and tighten two screws 1.
3) Referring to 1-1, mount the cassette compartment assembly.

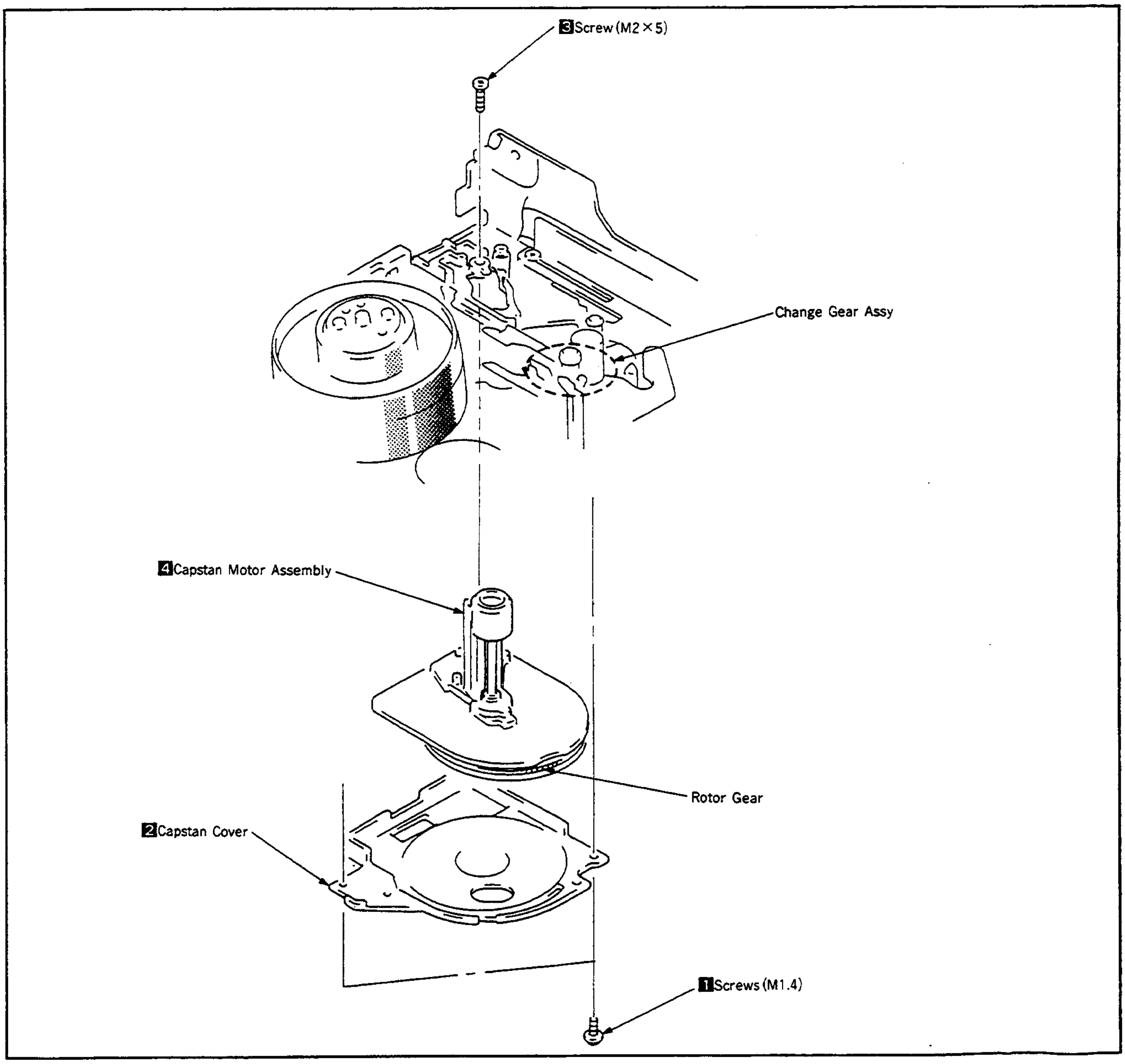

3Screw (M2 × 5)
Change Gear Assy
4Capstan Motor Assembly
Rotor Gear
2Capstan Cover
1Screws (M1.4)

Fig. 11

3-5. TAKE-UP REEL TABLE ASSEMBLY AND T- SOFT ASSEMBLY (Fig. 12)

1. Removal

1) Referring to 1-1, remove the cassette compartment assembly.
2) Referring to 3-1, remove the Retainer, Gooseneck assembly.
3) Remove the take-up reel table assembly ❶.
4) Remove the T soft assembly ❷, then the T soft arm ❸.

2. Mounting

1) Mount the T soft arm ❸ with its long hole ⓒ engaged with the boss ⓓ of LS chassis.
2) Mount the T soft assembly ❷ with its tab ⓐ engaged with a square hole ⓑ of T soft arm, as shown in Fig. a.
3) Mount the take-up reel table assembly ❶ and rotate it toward the arrow 🅐 to be latched with T hard claw.
4) Referring to 3-1. mount the Retainer, Gooseneck assembly.
5) Referring to 1-1, mount the cassette compartment assembly.

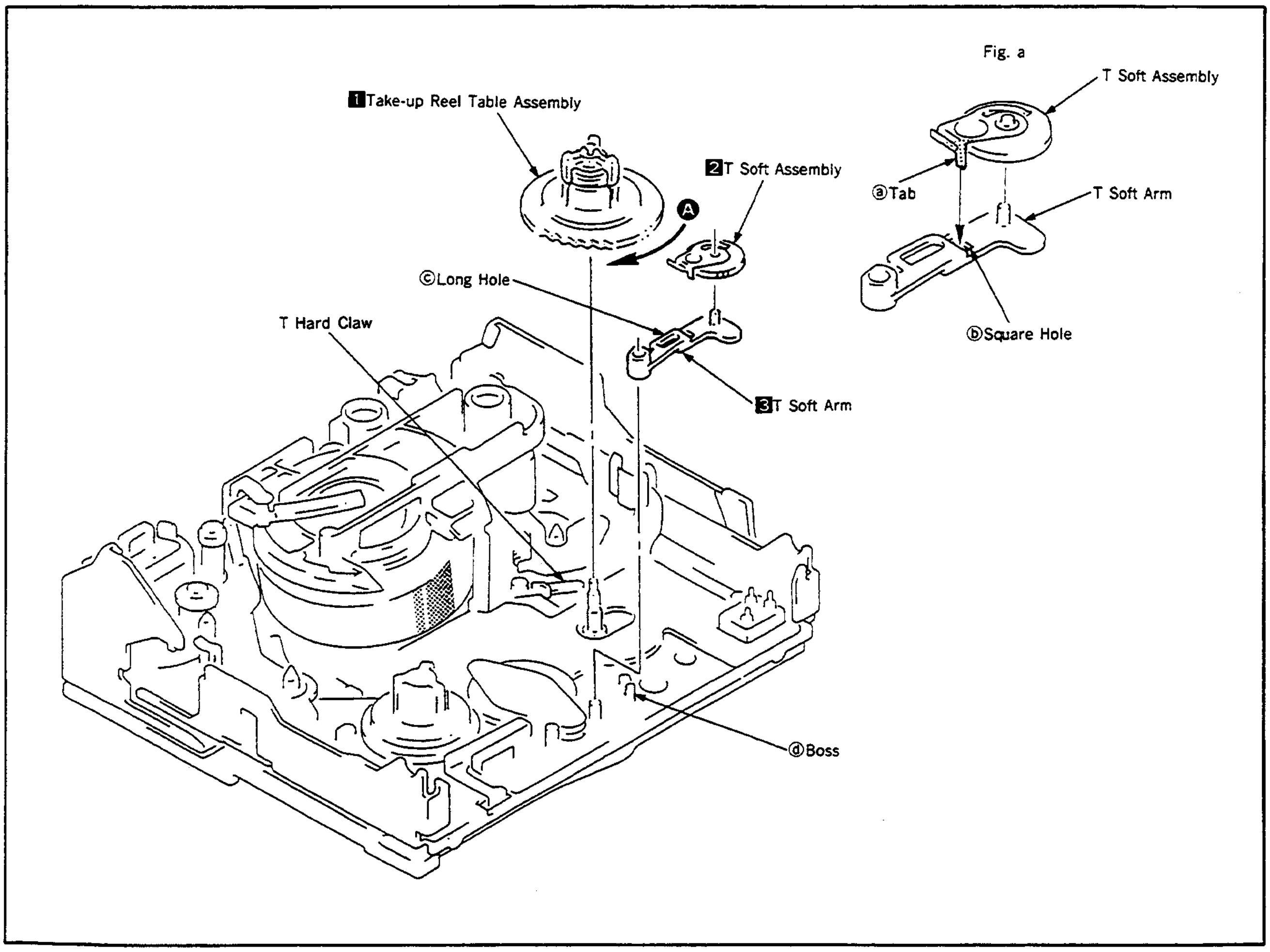


Fig. a
T Soft Assembly
ⓐTab
T Soft Arm
ⓑSquare Hole
❶Take-up Reel Table Assembly
❷T Soft Assembly
🅐
ⓒLong Hole
T Hard Claw
❸T Soft Arm
ⓓBoss

Fig. 12

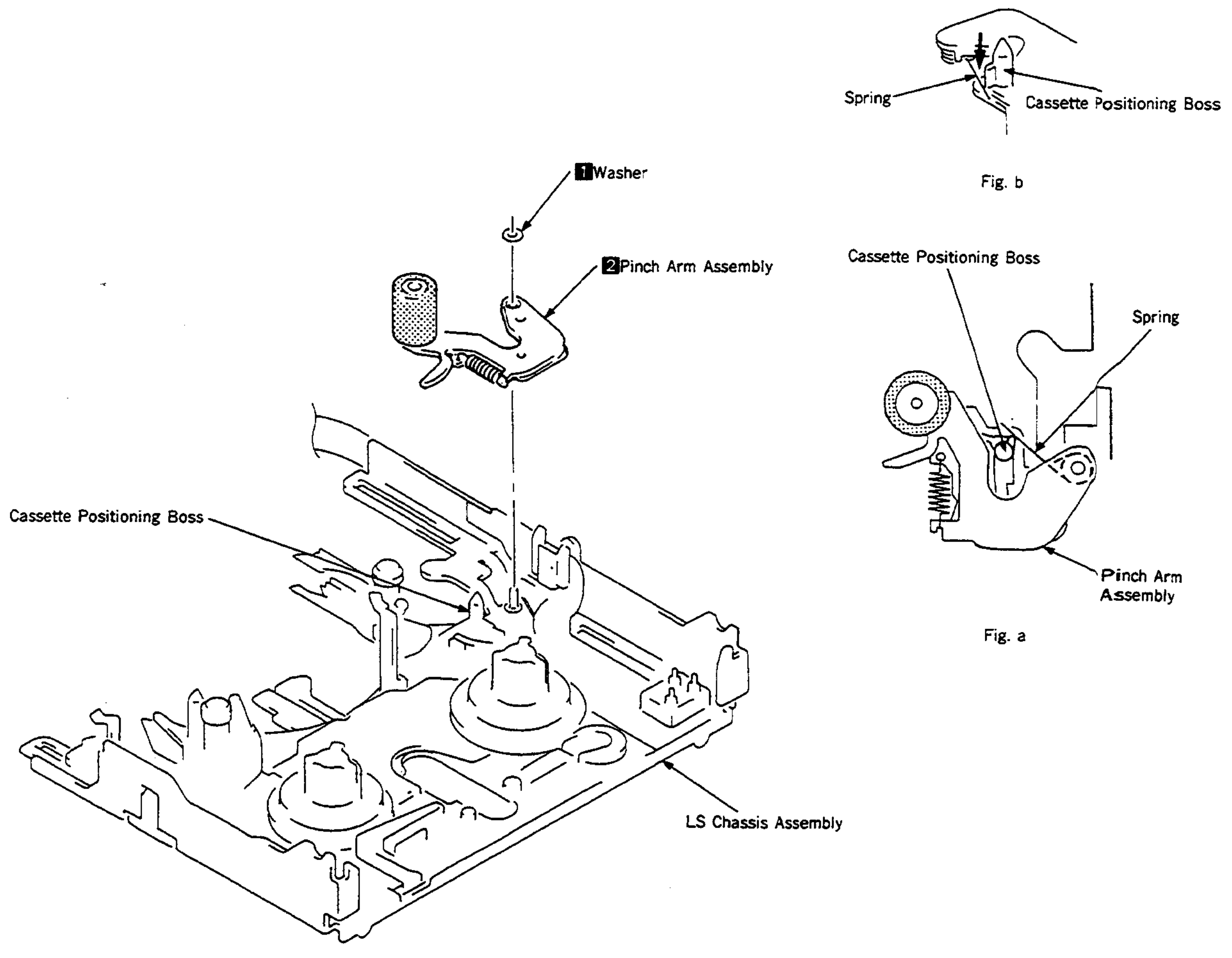
3-6. PINCH ARM ASSEMBLY (Fig. 13)

1. Removal

1) Referring to 1-1, remove the cassette compartment assembly.
2) Select the $\boxed{\text{READY}}$ mode.
3) Remove a washer ❶, then the pinch arm assembly ❷.

2. Mounting

1) Select the $\boxed{\text{READY}}$ mode.
2) Hooking a spring of pinch arm assembly ❷ to the casse positioning boss on the chassis, mount the pinch arm asser bly on the shaft of LS chassis assembly as shown in Fig. a.
3) Push in the spring with tweezers up to the root of boss as shown in Fig. b.
4) Mount the washer ❶.
5) Referring to 1-1, mount the cassette compartment assembly.



Spring
Cassette Positioning Boss
Fig. b
❶Washer
❷Pinch Arm Assembly
Cassette Positioning Boss
Spring
Cassette Positioning Boss
Pinch Arm Assembly
Fig. a
LS Chassis Assembly

Fig. 13

LS CHASSIS ASSEMBLY (Fig. 14)

1. Removal

1) Referring to 1-1, remove the cassette compartment assembly.
2) Referring to 3-1, remove the Retainer, Gooseneck assembly.
3) Referring to 3-2, remove the protector base assembly.
4) Remove a screw 1, TG-5 base holder 2, and LS flexible board 3.
5) Remove a lock washer 4, then the gooseneck as sembly 5.
6) Remove four screws 6, then the LS chassis assembly 7.

2. Mounting

1) Select the USE mode.
2) Confirm that the T hard claw and the outsert on the back of LS chassis are positioned as shown in Fig. a. (The T hard claw must be higher than corner ⓐ of chassis hole.) If not high, turn the outsert in the arrow direction while pushing the T hard claw from LS chassis to the chassis.
3) Sliding the GL slider, align the top edge of long hole ⓑ in GL slider with the edge face ⓒ of LS chassis hole as shown in Fig. b.
4) Mount the LS chassis assembly 7 on the chassis.

Note : At this time, aligh a dowel ⓓ on LS chassis with a long hole ⓔ of No.7 guide on chassis, a long hole of GL slider with a GL arm pin, a groove of LS cam plate with an LS arm pin respectively as shown in Fig. c and d.

5) Tighten four screws 6.
6) Mount the LS flexible board 3 and TG-5 base holder 2,then tighten the screw 1.
7) Mount the Gooseneck assembly 5 and fix it with a washer 4.

Note : Using the mode selector, confirm that loading and unloading are performed smoothly.

8) Referring to 3-2, mount the protector base assembly.
9) Referring to 3-1, mount the Retainer, Gooseneck assembly.
10) Referring to 1-1, mount the cassette compartment assembly.

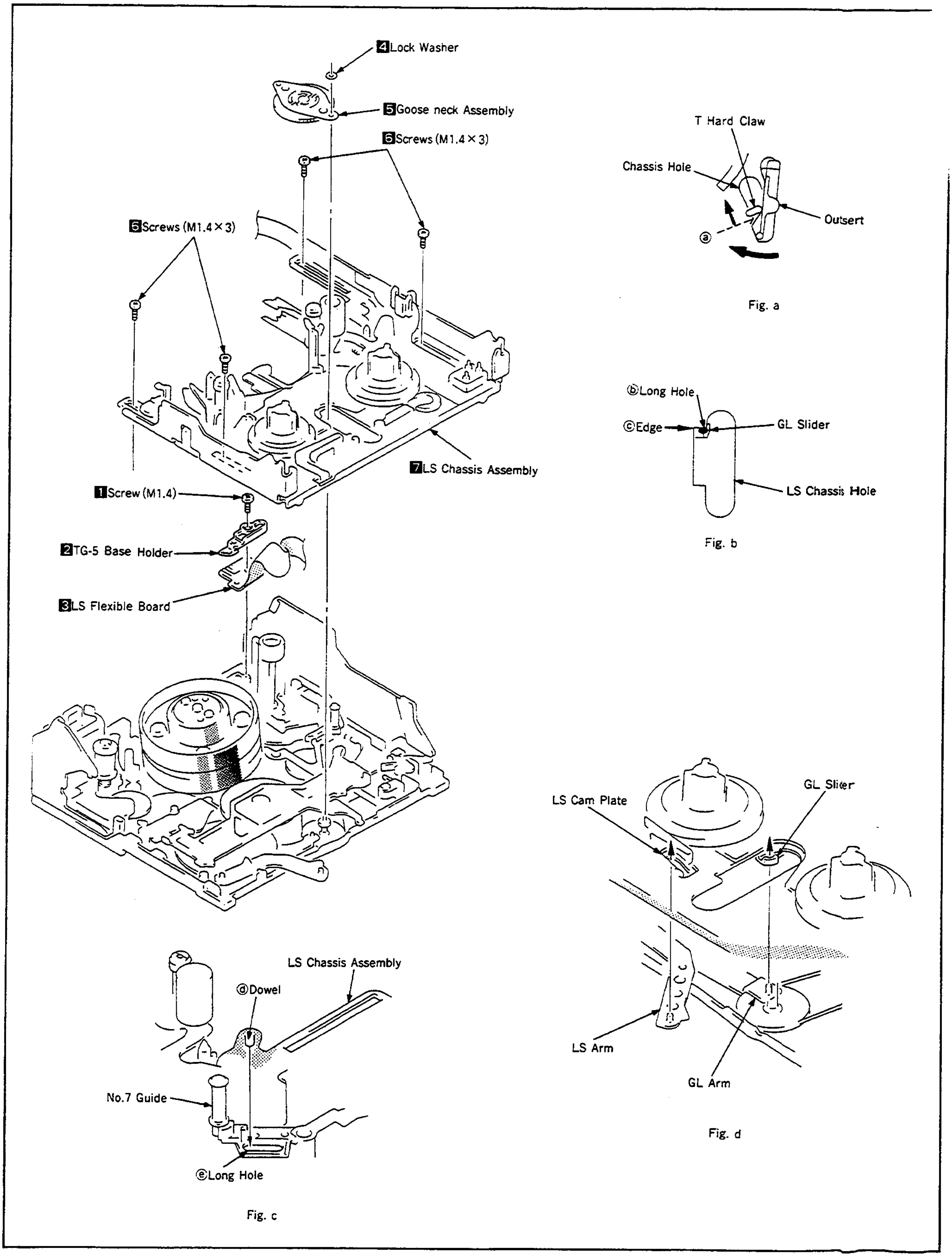

4 Lock Washer
5 Goose neck Assembly
6 Screws (M1.4 × 3)
6 Screws (M1.4 × 3)
7 LS Chassis Assembly
1 Screw (M1.4)
2 TG-5 Base Holder
3 LS Flexible Board
T Hard Claw
Chassis Hole
Outsert
ⓐ
ⓑLong Hole
ⓒEdge
GL Slider
LS Chassis Hole
LS Cam Plate
GL Slider
LS Arm
GL Arm
LS Chassis Assembly
ⓓDowel
No.7 Guide
ⓔLong Hole

Fig. a

Fig. b

Fig. c

Fig. d

Fig. 14

3- GUIDE BASE T ASSEMBLY AND GUIDE BASE S ASSEMBLY (Fig. 15, 16)

1. Removal

1) Referring to 1-1, remove the cassette compartment assembly.
2) Referring to 3-1, remove the Retainer Gooseneck assembly.
3) Referring to 3-2, remove the protector base assembly.
4) Referring to 3-7, remove the LS chassis assembly.
5) Push in the GL slider [1] toward the arrow Ⓐ, and remove the guide base T assembly [2] and guide base S assembly [3] from the guide rail respectively as shown in Fig. 15.

Note : Do not invert the LS chassis up side down, otherwise the T reel table assembly, T soft arm and T sofr assembly will drop. Also, take care not to allow the S reel table to float up, or the tension regulator string bends. (Refer to 3-5 T Reel Table Assembly and T Soft Assembly, and 3-10 S Reel Table Assembly and TG-1 Arm Assembly.)

6) Turning the guide base T assembly [2] and guide base S assembly [3] respectively, align the shaft to hole to remove as shown in Fig. a.

2. Mounting

1) Turning the guide base T assembly [2] and guide base S assembly [3] respectively, align the shaft with a hole to mount as shown in Fig. a (Fig. 15).
2) On the back side of chassis, insert the guide arm T assembly [4], guide arm S assembly [5] and GL slider [1] from position shown in Fig.b to position shown in Fig. c. Also, aligning the guide base T assembly [2] and guide base S assembly [3] with the respective guide rails, push in the GL slider [1] toward the arrow Ⓑ as shown in Fig. 16.

Note : Do not invert the LS chassis up side down, otherwise the T reel table assembly, T soft arm and T soft assembly will drop. Also, take care not to allow the S reel table to float up, or the tension regulator string bends. (Refer to 3-5 T Reel Table Assembly and T Soft Assembly, and 3-10 S Reel Table Assembly and TG-1 Arm Assembly.)

3) Referring to 3-7, mount the LS chassis assembly.
4) Referring to 3-2, mount the protector base assembly.
5) Referring to 3-1, mount the Retainer, Gooseneck assembly.

Note : At this time, confirm that the T soft assembly is surely engaged with the T soft arm.

6) Referring to 1-1, mount the cassette compartment assembly.

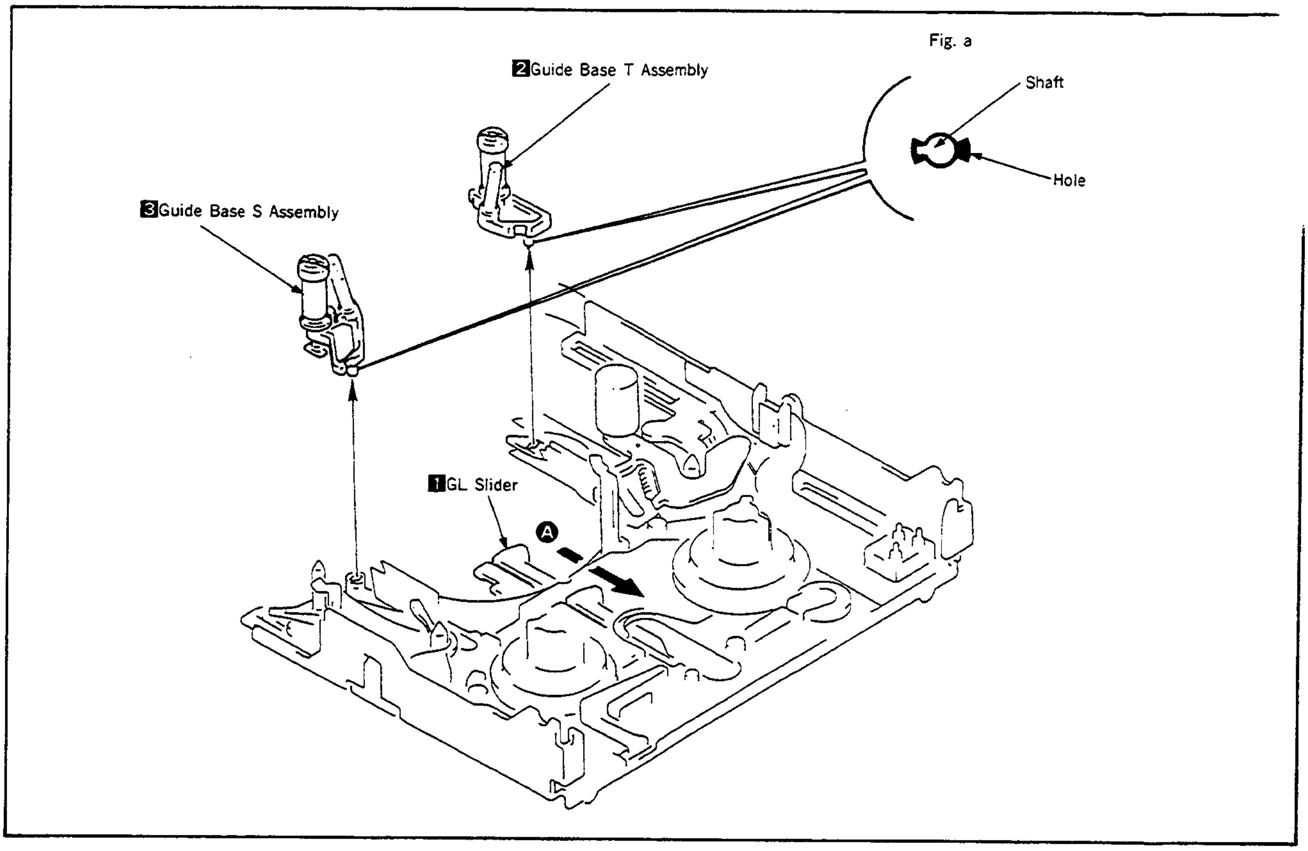


Fig. a
❷Guide Base T Assembly
Shaft
Hole
❸Guide Base S Assembly
❶GL Slider
A

Fig. 15

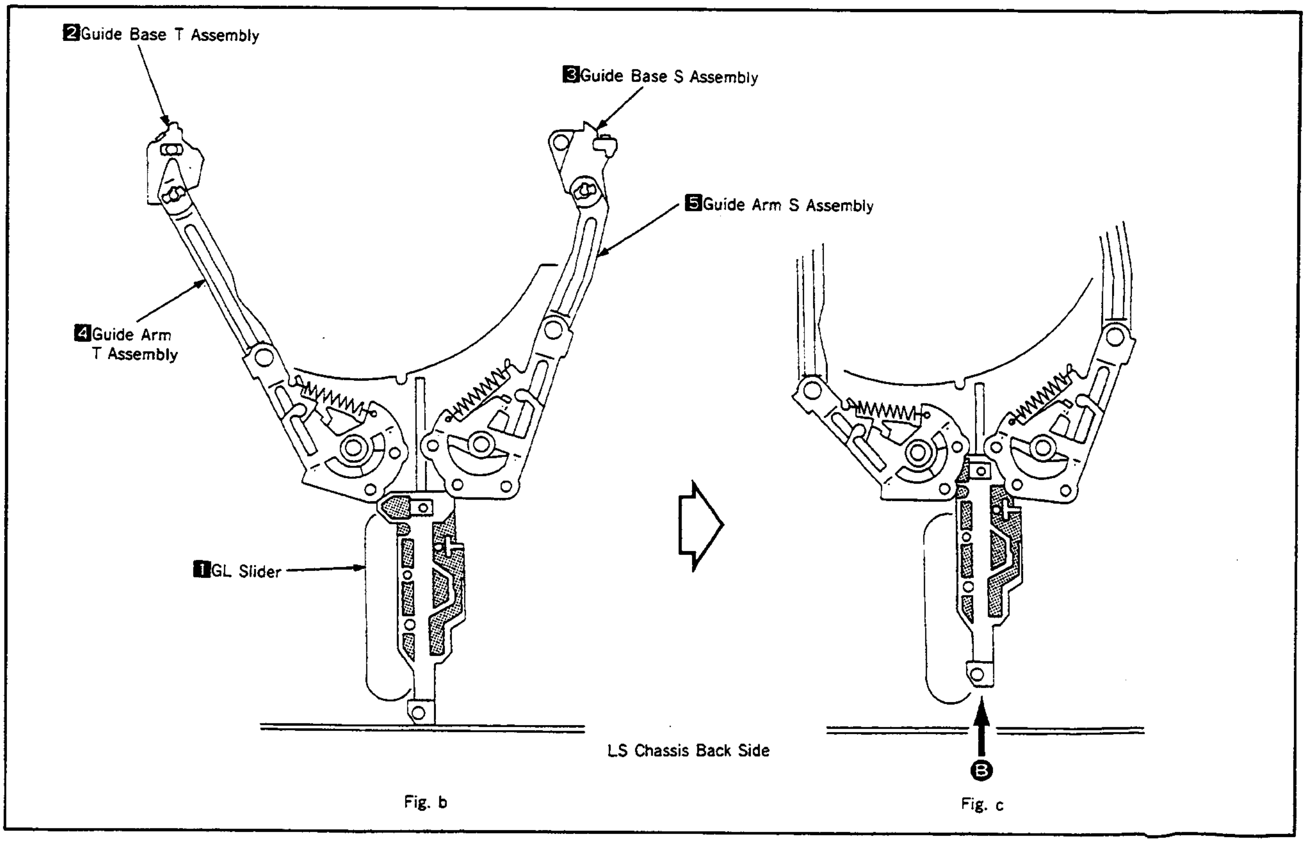

❷Guide Base T Assembly
❸Guide Base S Assembly
❺Guide Arm S Assembly
❹Guide Arm
T Assembly
❶GL Slider
LS Chassis Back Side
B

Fig. b

Fig. c

Fig. 16

3 GUIDE ARM T ASSEMBLY AND GUIDE ARM S ASSEMBLY (Fig. 17)

1. Removal

1) Referring to 1-1, remove the cassette compartment assembly.
2) Referring to 3-1, remove the Retainer, Gooseneck assembly.
3) Referring to 3-2, remove the protector base assembly.
4) Referring to 3-7, remove the LS chassis assembly.
5) Referring to 3-8, remove the guide base T assembly and guide base S assembly.
6) Remove lock washers 1, then the guide arm T assembly 2 and guide arm S assembly 3 respectively from the back side of chassis.

Note : Do not invert the LS chassis up side down, otherwise the T reel table assembly, T soft arm and T soft assembly will drop. Also, take care not to allow the S reel table to float up, or the tension regulator string bends. (Refer to 3-5 T Reel Table Assembly and T Soft Assmbly, and 3-10 S Reel Table Assembly and TG-1 Arm Assembly.)

2. Mounting

1) Mount the guide arm T assembly 2 and guide arm S assembly 3, then fix them with a lock washer 1 respectively.

Note : Do not invert the LS chassis up side down, otherwise the T reel table assembly, T soft arm and T soft assembly will drop. Also, take care not to allow the S reel table to float up, or the tension regulator string bends. (Refer to 3-5 T Reel Table Assembly and T Soft Assembly, and 3-10 S Reel Table Assembly and TG-1 Arm Assembly.)

2) Referring to 3-8, mount the guide base T assembly, guide-base S assembly and GL slider.
3) Referring to 3-7, mount the LS chassis assembly.
4) Referring to 3-2, mount the protector base assembly.
5) Referring to 3-1, mount the Retainer, Gooseneck assembly.
6) Referring to 1-1, mount the cassette compartment assembly.

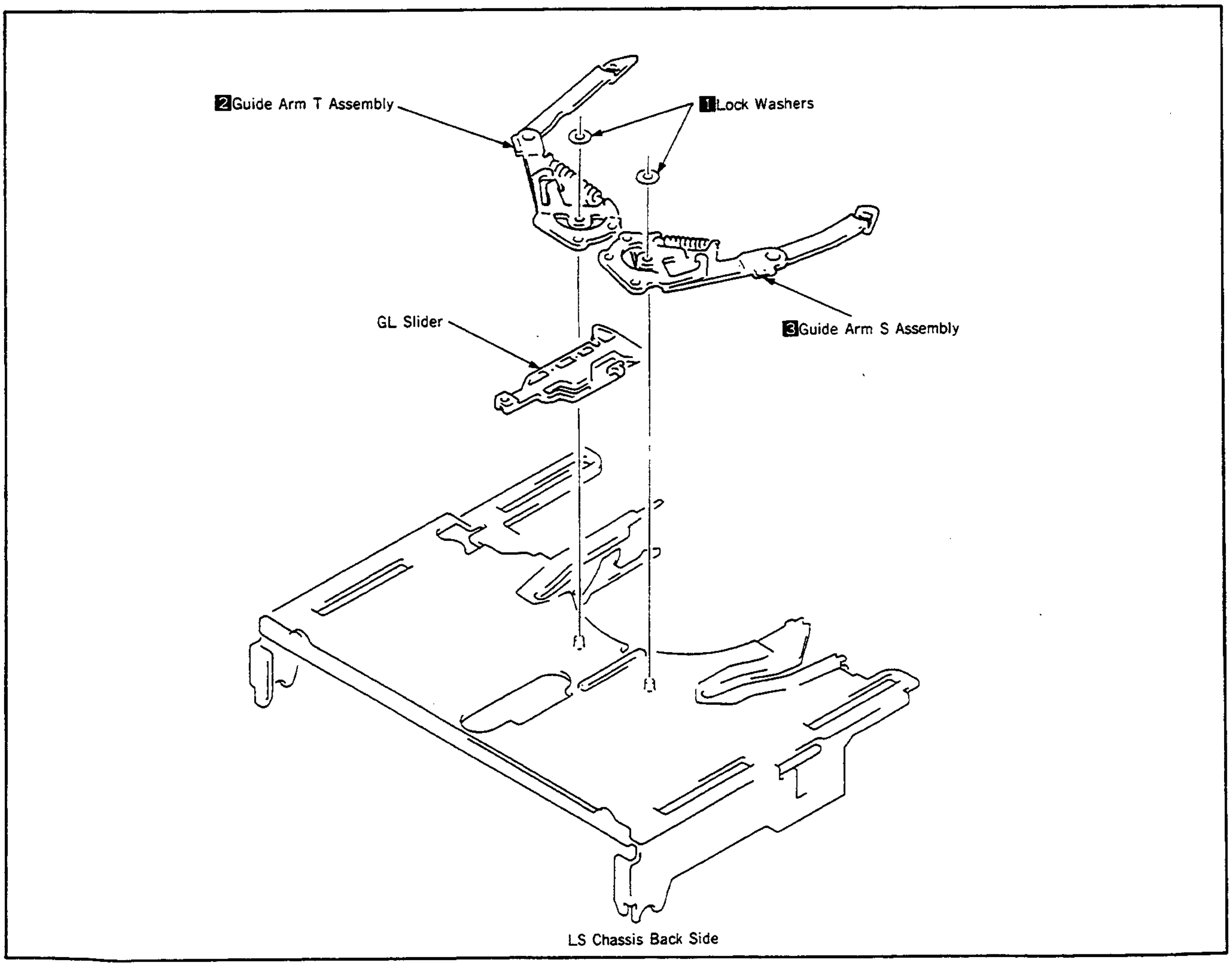


Fig. 17

3-10. SUPPLY REEL TABLE ASSEMBLY AND TG-1 ARM ASSEMBLY (Fig. 18)

1. Removal

1) Referring to 1-1, remove the cassette compartment assembly.
2) Referring to 3-1, remove the Retainer, Gooseneck assembly.
3) Referring to 3-2, remove the protector base assembly.
4) Referring to 3-7, remove the LS chassis assembly.
5) Referring to 3-8, remove the guide base S assembly.
6) Remove a screw **1**, then the string **2** from the supply reel table assembly **3**. For easy removal of string block **4**, insert a flat-blade screwdriver into a groove ⓐ and push it up (Fig. a).
7) Remove the supply reel table assembly **3**.
8) Remove a tension coil spring **5**.
9) Turn the TG-1 arm assembly **6** up to a portion ⓒ of LS chassis hole in the arrow Ⓐ direction so that its tab ⓑ can be disengaged (Fig. b).

2. Mounting

1) Pushing the S soft brake **7** toward the arrow Ⓑ, mount thesupply reel table assembly **3**.
2) Route the string **2** under the TG-1 arm asembly **6**, andinsert the tab ⓑ of TG-1 arm assembly into the LS chassis hole ⓒ, then turn the TG-1 arm assembly in the reverse direction of arow Ⓐ (Fig. b).
3) Wind the string **2** along the groove of supply reel t assembly **3** (Fig. a).

Note : Do not curl the string extremely. Also, avoid adhesion oil, otherwise the image will be distorted.

4) Using the FWD B.T. adjusting driver (Ref. No. J-15), shift the string block **4** toward the arrow Ⓒ and tighten the screw **1** (Fig. a).
5) Engage the tension coil spring **5** to the chassis hook.

Note : Confirm that the string **2** is surely wound around the groove of supply reel table assembly **3** (Fig.a).

6) Referring to 3-8, mount the guide base S assembly.
7) Referring to 3-7, mount the LS chassis assembly.
8) Referring to 3-2, mount the protector base assembly.
9) Referring to 3-1, mount the Retainer, Gooseneck assembly.

Note : At this time, confirm that the T soft assembly is surely engaged with the T soft arm. (Refer to 3-5 Take-up Reel Table Assembly and Take-up Soft Assembly.)

10) Referring to 1-1, mount the cassette compartment assembly.

Note : Referring to 3-22, adjust the tension regulator position.

Note : Referring to 3-23, adjust the forward back tension.

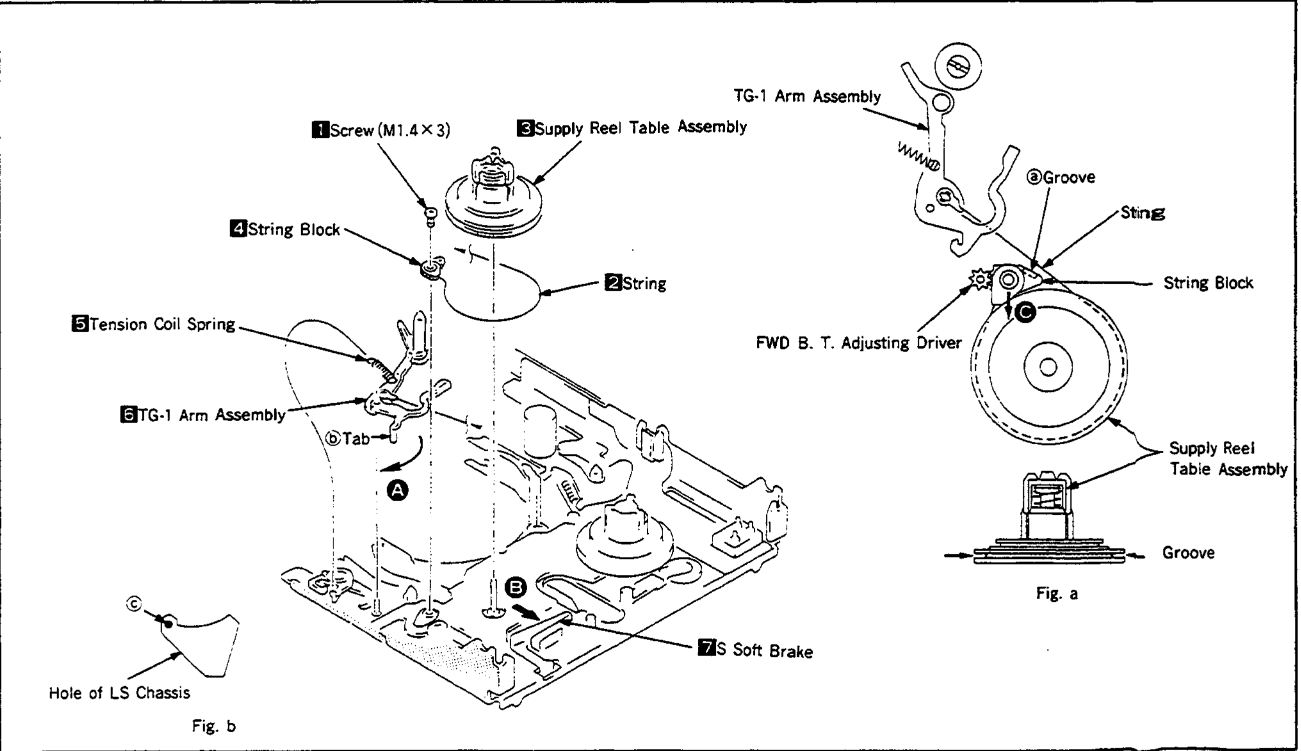

1 Screw (M1.4 × 3)
3 Supply Reel Table Assembly
4 String Block
2 String
5 Tension Coil Spring
6 TG-1 Arm Assembly
ⓑ Tab
Ⓐ
Ⓑ
7 S Soft Brake
ⓒ
Hole of LS Chassis
Fig. b
TG-1 Arm Assembly
ⓐ Groove
Sting
String Block
Ⓒ
FWD B. T. Adjusting Driver
Supply Reel Table Assembly
Groove
Fig. a

Fig. 18

3. TG-2 ROLLER ASSEMBLY (Fig. 19)

1. Removal

1) Remove the TG-2 roller assembly 1 .
2) Remove a compression coil spring 2 .

2. Mounting

1) Insert a compression coil spring 2 into the boss on chassis.
2) Rotate gently the TG-2 roller assembly 1 until the screw is engaged.

3. Presetting of TG-2 Roller Height (Fig. a)

1) Rotating the TG-2 upper flange, adjust the height of bottom face of TG-2 lower flange from the top face of dowel on the mechanical chassis to 3. 3 ± 0. 05mm.

Note : After adjustment, perform 4. TAPE PATH ADJUSTMENT.

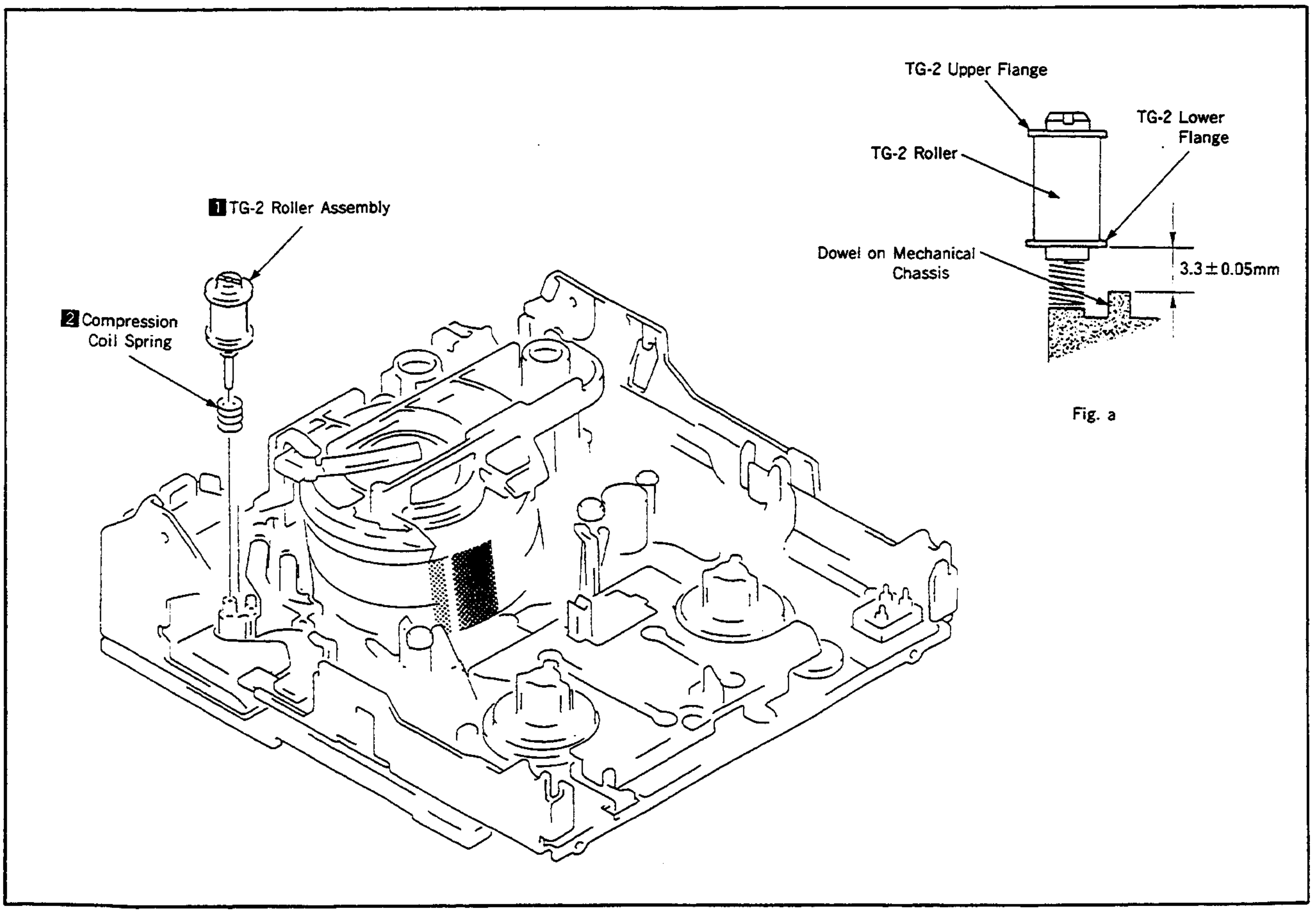

1 TG-2 Roller Assembly
2 Compression Coil Spring
TG-2 Upper Flange
TG-2 Lower Flange
TG-2 Roller
Dowel on Mechanical Chassis
3.3±0.05mm

Fig. a

Fig. 19

3-12. TG-7 ARM ASSEMBLY (Fig. 20)

1. Removal

1) Referring to 1-1, remove the cassette compartment assembly.
2) Referring to 3-1, remove the Retainer, Gooseneck assembly.
3) Referring to 3-2, remove the protector base assembly.
4) Referring to 3-7, remove the LS chassis assembly.
5) Raise a portion ⓐ of TG-7 arm Leaf spring **1** in arrow direction with a flat-blade screwdriver or tweezers to disengage the tab from the chassis, then remove the TG-7 arm Leaf spring as shown in Fig. a.
6) Remove the TG-7 assembly **2** from the shaft of mechanical-chassis.

2. Mounting

1) Mount the TG-7 arm assembly **2** to the shaft of mechanic chassis.
2) Mount the TG-7 arm Leaf spring **1** to the mechanicalchasis.
   *Push in the tab of Leaf spring until it clicks into a detent ofchassis (Fig. a).
3) Referring to 3-7, mount the LS chassis assembly.
4) Referring to 3-2, mount the protector base assembly.
5) Referring to 3-1, mount the Retainer, Gooseneck assembly.
6) Referring to 1-1, mount the cassette compartmnet assembly.

Note : After mounting, perform 4. TAPE PATH ADJUSTMENT.

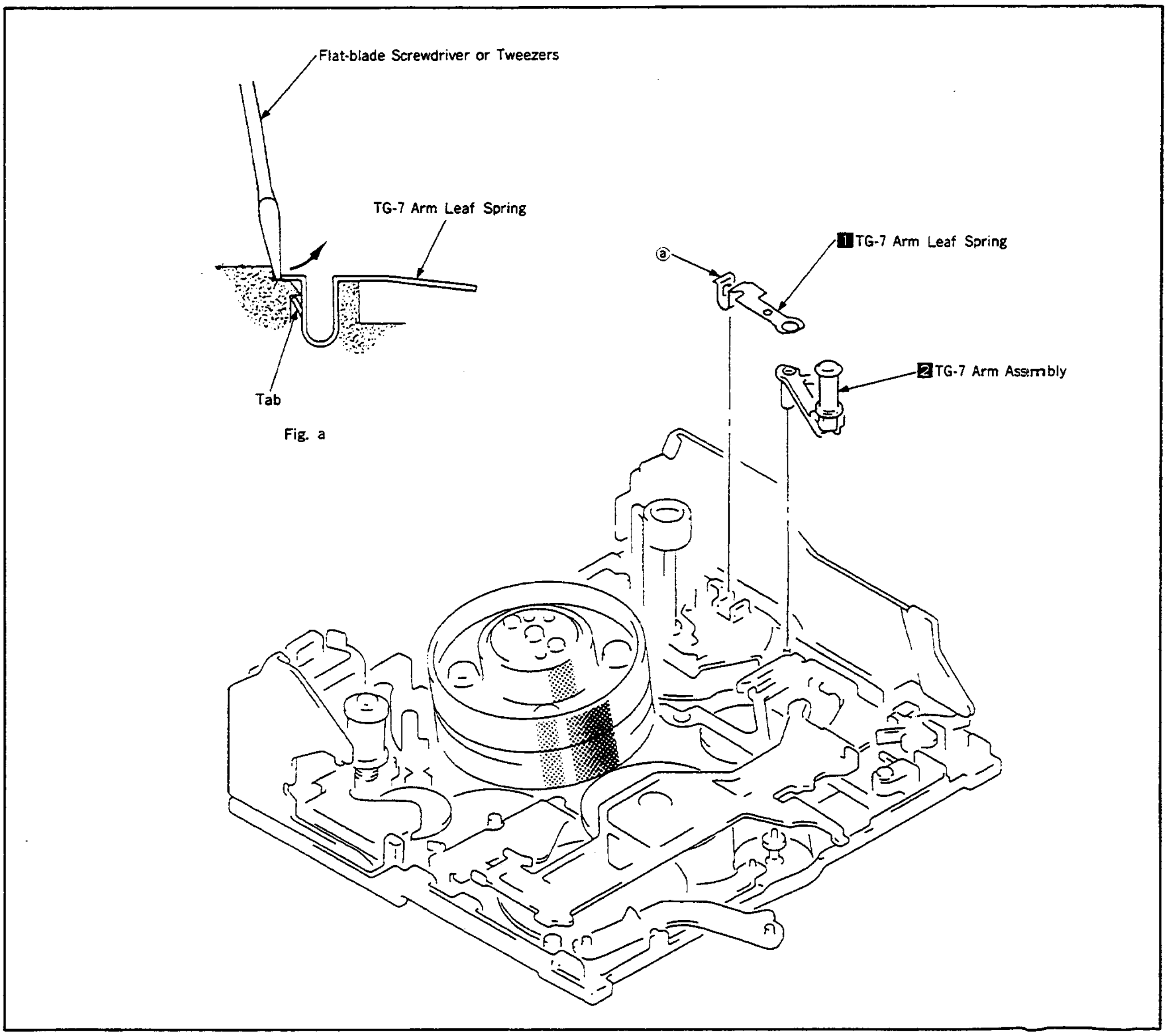


Fig. 20

3 . LM MOTOR ASSEMBLY (Fig. 21)

1. Removal

1) Referring to 1-1, remove the cassette compartment assembly.
2) Referring to 3-1, remove the Retainer, Gooseneck assembly.
3) Referring to 3-2, remove the protector base assembly.
4) Referring to 3-7, remove the LS chassis assembly.
5) Select the LOAD mode (at the position where the FF arm assembly is not above the screw ❶).
6) Remove two screws ❶, then the LM motor assembly ❷.

2. Mounting

1) Aligning the dowel ⓐ of LM motor assembly ❷ with the hole ⓑ of mechanical chassis, mount the LM motor assembly with its hole ⓒ inserted into the mechanical chassis shaft ⓓ.
2) Tighten two screws ❶.
3) Referring to 3-7, mount the LS chassis assembly.
4) Referring to 3-2, mount the protector base assembly.
5) Referring to 3-1, mount the Retainer, Gooseneck assembly.
6) Referring to 1-1, mount the cassette compartment assembly.

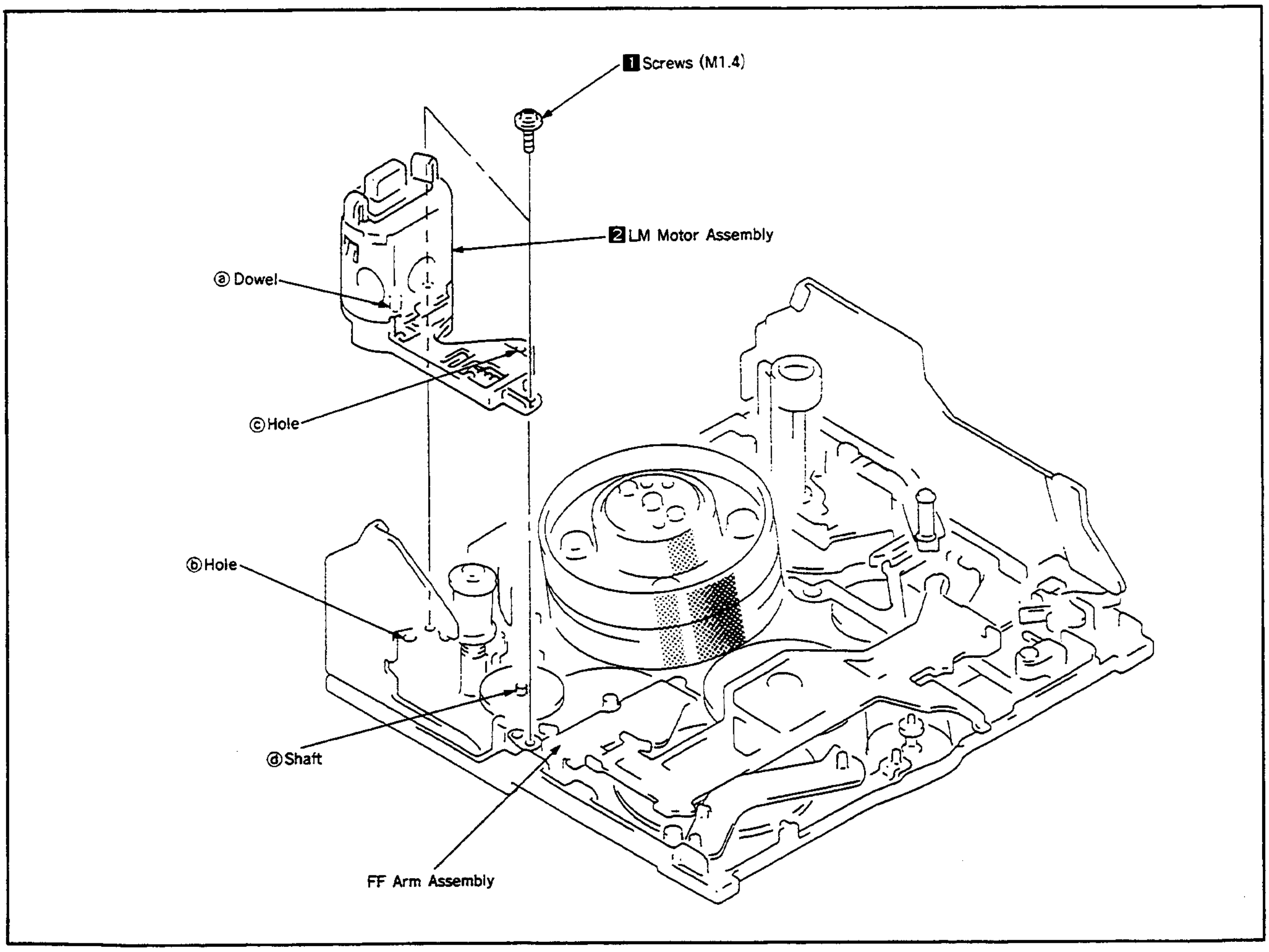


Fig. 21

3-14. LS ARM (Fig. 22)

1. Removal

1) Referring to 1-1, remove the cassette compartment assembly.
2) Referring to 3-1, remove the Retainer, Gooseneck assembly.
3) Referring to 3-2, remove the proctector base assembly.
4) Referring to 3-7, remove the LS chassis assembly.
5) Remove the LS arm ❶ from the shaft of mechanical chassis.

Note : Take care not to drop the LS roller ❷.

2. Mounting

1) Mount the LS arm ❶ meeting with mechanical chassis sh and cam groove.

Note : Move the LS arm ❶ in arrow direction to confirm that the LS roller ❷ is surely inserted.

2) Referring to 3-7, mount the LS chassis assembly.
3) Referring to 3-2, mount the protector base assembly.
4) Referring to 3-1, mount the Retainer, Gooseneck assembly.
5) Referring to 1-1, mount the cassette compartment assembly.

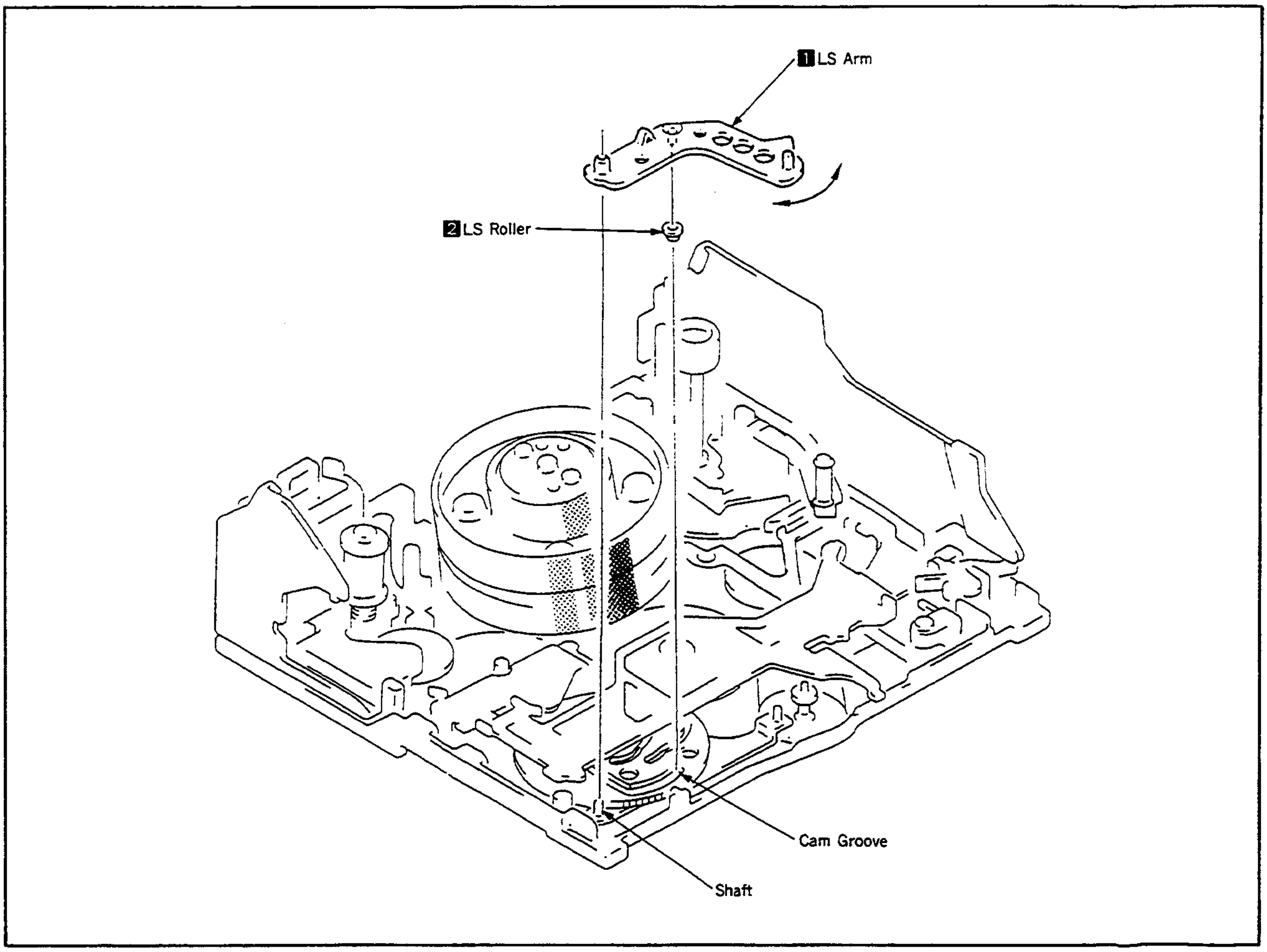


Fig. 22

. M SLIDER ASSEMBLY (Fig. 23)

Removal

1) Referring to 1-1, remove the cassette compartment assembly.
2) Referring to 3-1, remove the Retainer, Gooseneck assembly.
3) Referring to 3-2, remove the protector base assembly.
4) Referring to 3-7, remove the LS chassis assembly.
5) Remove two screws ❶, then the gear holder ❷.
6) Remove two lock washers ❸, then the M slider assembly ❹.

2. Mounting

1) Mount the M slider assembly ❹, aligning long holes ⓐ and ⓑ of M slider assembly with shafts ⓒ and ⓓ of mechanical chassis, and a long hole ⓔ with shaft ⓕ of press arm assembly, and also shaft ⓖ with outer groove ⓗ of cam respectively.
2) Mount two lock washers ❸.
3) Mount the gear holder ❷ with its outserts ⓘ and ⓙ inserted into holes in the mechanical chassis.
4) Tighten two screws ❶.
5) Referring to 3-7, mount the LS chassis assembly.
6) Referring to 3-2, mount the protector base assembly.
7) Referring to 3-1, mount the Retainer, Gooseneck assembly.
8) Referring to 1-1, mount the cassette compartment assembly.

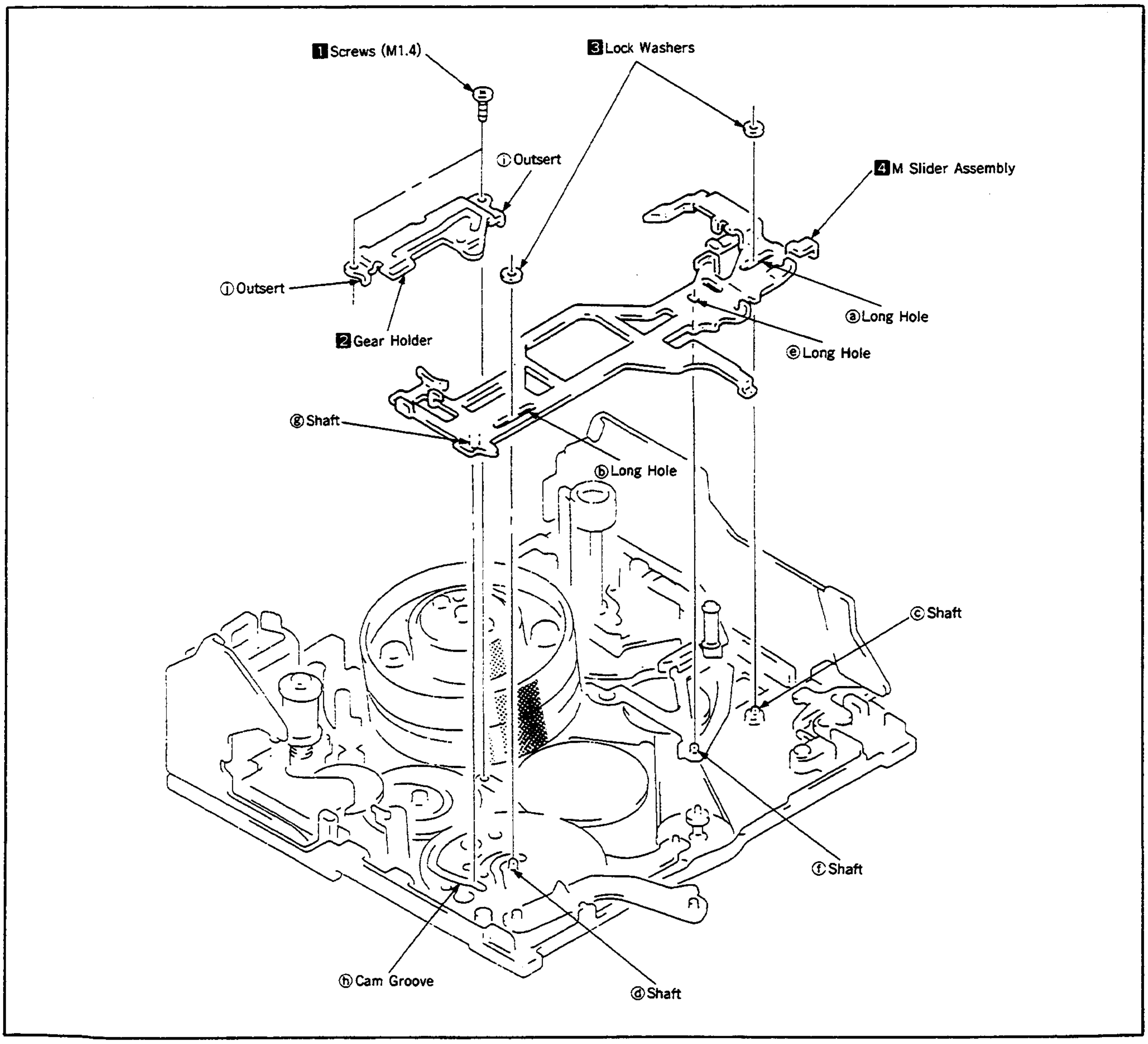

❶Screws (M1.4)
❸Lock Washers
ⓘOutsert
❹M Slider Assembly
ⓙOutsert
ⓐLong Hole
❷Gear Holder
ⓔLong Hole
ⓖShaft
ⓑLong Hole
ⓒShaft
ⓕShaft
ⓗCam Groove
ⓓShaft

Fig. 23

3-16. PINCH PRESS ARM ASSEMBLY (Fig. 24)

1. Removal

1) Referring to 1-1, remove the cassette compartment assembly.
2) Referring to 3-1, remove the Retainer, Gooseneck assembly.
3) Referring to 3-2, remove the protector base assembly.
4) Referring to 3-3, remove the drum assembly.
5) Referring to 3-7, remove the LS chassis assemvly.
6) Referring to 3-15, remove the M slider assembly.
7) Remove a lock washer **1**, then pinch press arm assembly **2**.

2.Mounting

1) Mount the pinch press arm assembly **2**, inserting its sh ⓐ into the cam groove ⓑ of HC drive arm, and hole ⓒ in the shaft ⓓ of mechanical chassis.
2) Mount the lock washer **1**.
3) After mounting, shift the pinch press arm assembly toward the arrow direction.
4) Referring to 3-15, mount the M slider assembly.
5) Referring to 3-7, mount the LS chassis assembly.
6) Referring to 3-3, mount the drum assembly.
7) Referring to 3-2, mount the protector base assembly.
8) Referring to 3-1, mount the Retainer, Gooseneck assembly.
9) Referring to 1-1, mount the cassette compartment assembly.

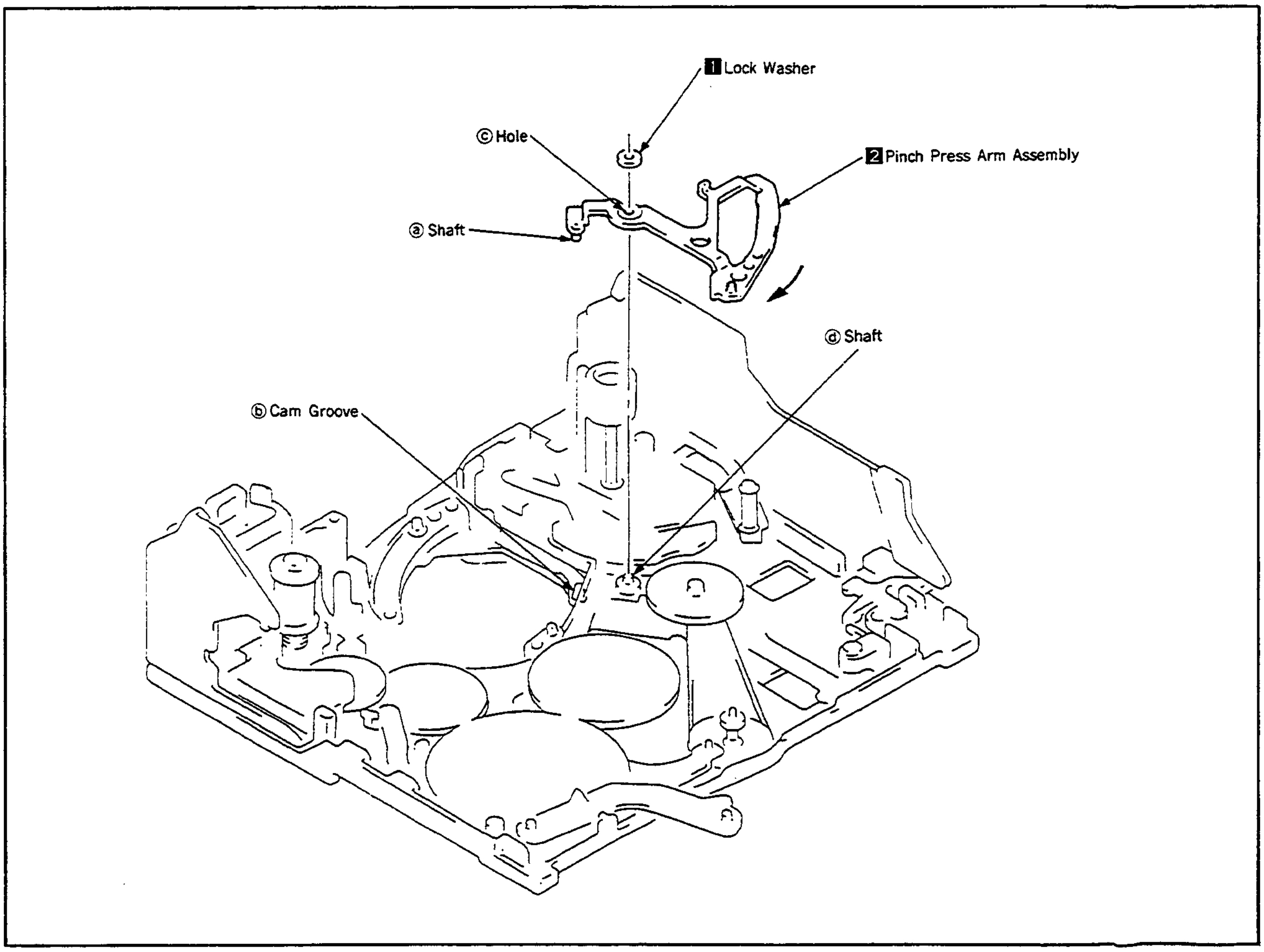


Fig. 24

7. CAM (Fig. 25)

Removal

Referring to 1-1, remove the cassette compartment assembly.
Referring to 3-1, remove the Retainer, Gooseneck assembly.
Referring to 3-2, remove the protector base assembly.
4) Referring to 3-7, remove the LS chassis assembly.
5) Referring to 3-14, remove the LS arm assembly.
6) Referring to 3-15, remove the M slider assembly.
7) Remove the cam ❶.

2. Mounting

1) Referring to 3-13, remove the LM motor assembly.

Note : Take care not to allow grease of LM motor assembly to stick to the TG-2 roller assembly.

2) Mount the cam ❶, aligning its center hole with shaft of mechanical chassis, and the cam groove with the shaft of GL arm assembly. At this time , make sure that the ▲ mark on L gear B is aligned with that on the cam and also a recess is aligned with the phase aligning hole respectively as shown in Fig. a.

Note : Apply grease to the cam groove if it scarecely remains.

3) Mount the LM motor assembly.
4) Referring to 3-15, mount the M slider assembly.
5) Referring to 3-14, mount the LS arm assembly.
6) Referring to 3-7, mount the LS chassis assembly.
7) Referring to 3-2, mount the protector base assembly.
8) Referring to 3-1, mount the Retainer, Gooseneck assembly.
9) Referring to 1-1, mount the cassette compartment assembly.

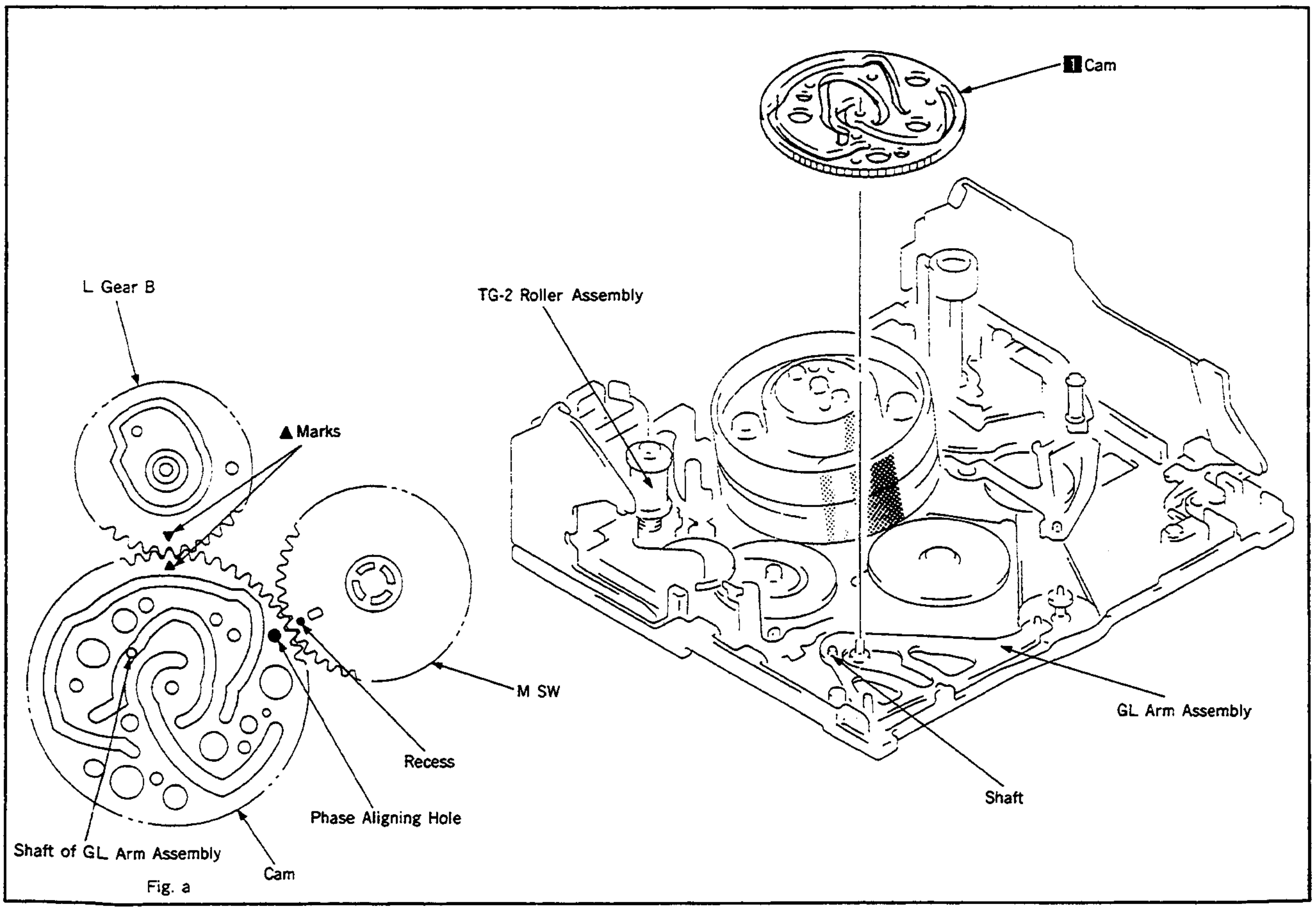


Fig. 25

3-18. GL ARM ASSEMBLY (Fig. 26)

1. Removal

1) Referring to 1-1, remove the cassette compartment assembly.
2) Referring to 3-1, remove the Retainer, Gooseneck assembly.
3) Referring to 3-2, remove the protector base assembly.
4) Referring to 3-7, remove the LS chassis assembly.
5) Referring to 3-14, remove the LS arm assembly.
6) Referring to 3-15, remove the M slider assembly.
7) Referring to 3-17, remove the cam.
8) Remove the GL arm assembly ❶.

2. Mounting

1) Mount the GL arm assembly ❶ with its hole ⓐ inserted in the shaft ⓑ of mechanical chassis.
2) Referring to 3-17, mount the cam.
3) Referring to 3-15, mount the M slider assembly.
4) Referring to 3-14, mount the LS arm assembly.
5) Referring to 3-7, mount the LS chassis assembly.
6) Referring to 3-2, mount the protector base assembly.
7) Referring to 3-1, mount the Retainer, Gooseneck assembly.
8) Referring to 1-1, mount the cassette compartment assembly.

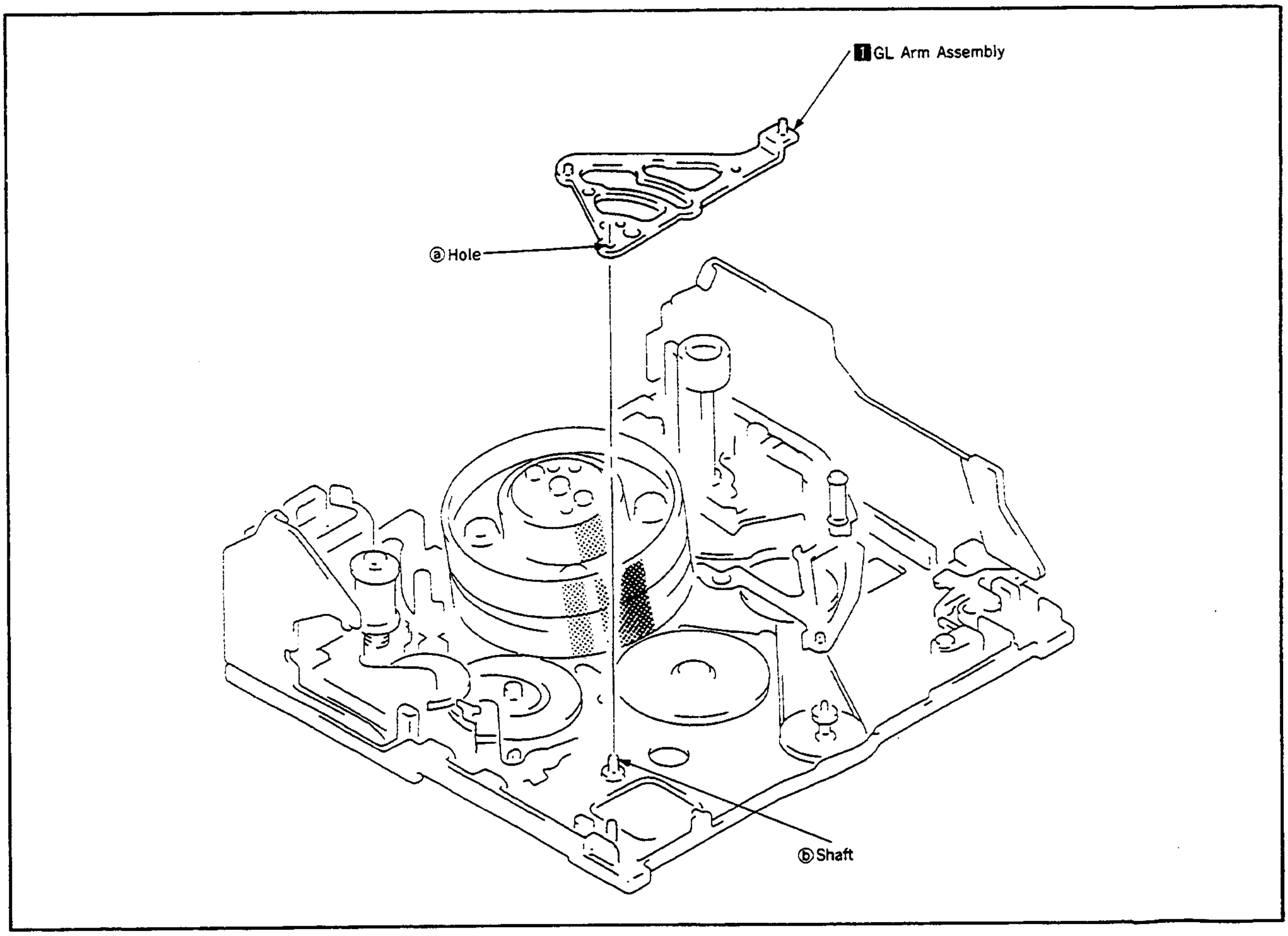


Fig. 26

9. L GEAR A AND L GEAR B (Fig. 27)

Removal

1) Referring to 1-1, remove the cassette compartment assembly.
2) Referring to 3-1, remove the Retainer, Gooseneck assembly.
3) Referring to 3-2, remove the protector base assembly.
4) Referring to 3-7, remove the LS chassis assembly.
5) Referring to 3-14, remove the LS arm assembly.
6) Referring to 3-15, remove the M slider assembly.
7) Referring to 3-17, remove the cam.
8) Referring to 3-13, remove the LM motor assembly.
9) Remove the FF arm assembly ❶.
10) Remove the L gear A ❷.
11) Remove the L gear B ❸.

2. Mounting

1) Insert the L gear B ❸ into the shaft of mechanical chassis. (At this time, the phase aligning mark ▲ should be faced toward the cam mounting shaft ⓐ.)
2) Insert the L gear A ❷ into the shaft of mechanical chassis.
3) Mount the FF arm assembly ❶ with its two shafts inserted into the cam groove of L gear B ❸ and the hole of mechanical chassis.
4) Referring to 3-17, mount the cam.
5) Referring to 3-13, mount the LM motor assembly.
6) Referring to 3-15, mount the M sleder assembly.
7) Referring to 3-14, mount the LS arm assembly.
8) Referring to 3-7, mount the LS chassis assembly.
9) Referring to 3-2, mount the protector base assembly.
10) Referring to 3-1, mount the Retainer, Gooseneck assembly.
11) Referring to 1-1, mount the cassette compartment assembly.

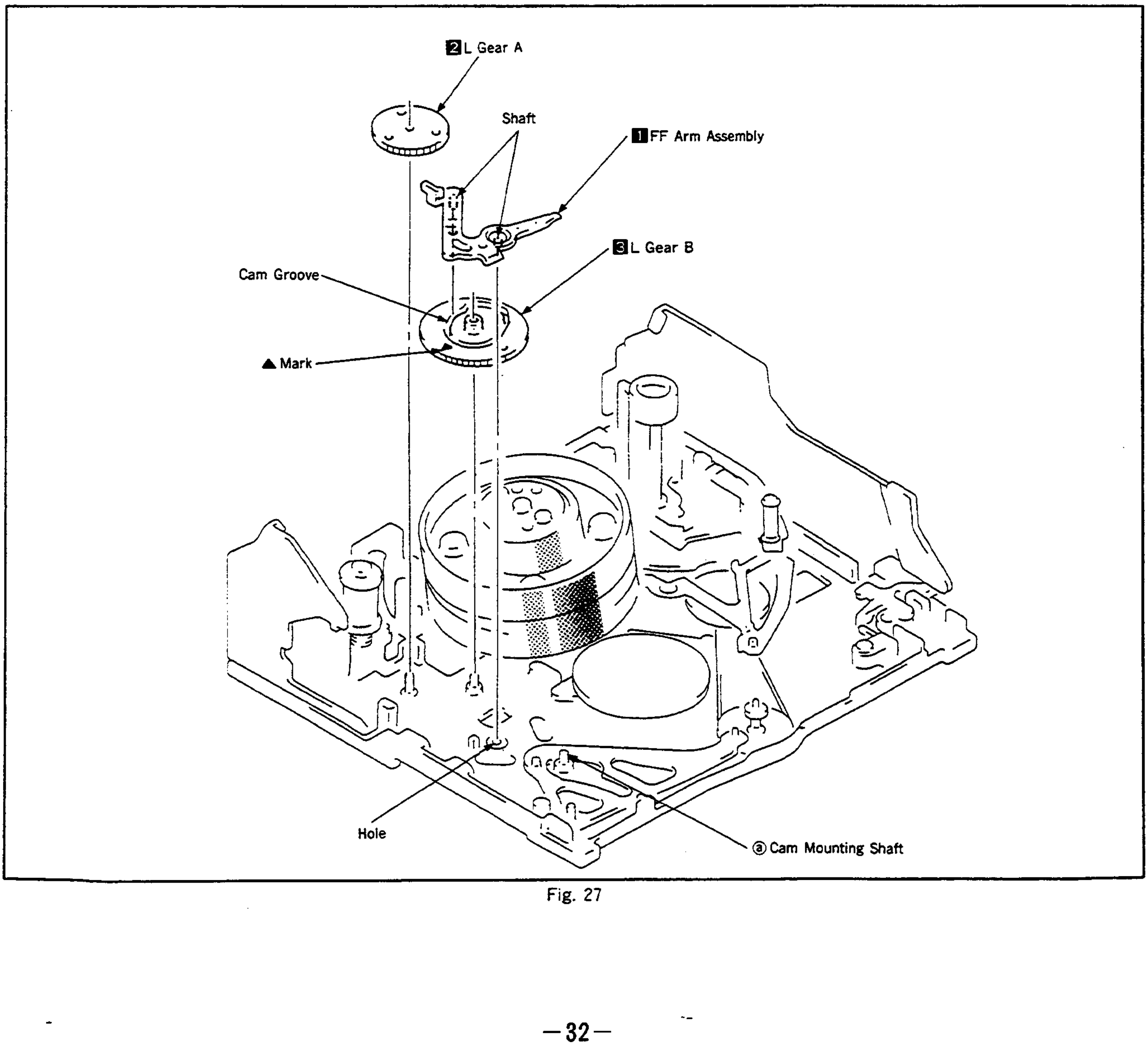


Fig. 27

3-20. RELAY PULLEY AND CHANGE GEAR ASSEMBLY (Fig. 28)

1. Removal

1) Referring to 1-1, remove the cassette compartment assembly.
2) Referring to 3-1, remove the Retainer, Gooseneck assembly.
3) Referring to 3-2, remove the protector base assembly.
4) Referring to 3-3, remove the drum assembly.
5) Referring to 3-7, remove the LS chassis assembly.
6) Referring to 3-14, remove the LS arm assembly.
7) Referring to 3-15, remove the M slider assembly.
8) Referring to 3-17, remove the cam.
9) Referring to 3-18, remove the GL arm assembly.
10) Referring to 3-16, remove the pinch press arm assembly.
11) Remove a lock washer ❶, then remove together the Change gear assembly ❷, relay belt ❸ and relay pulley ❹.

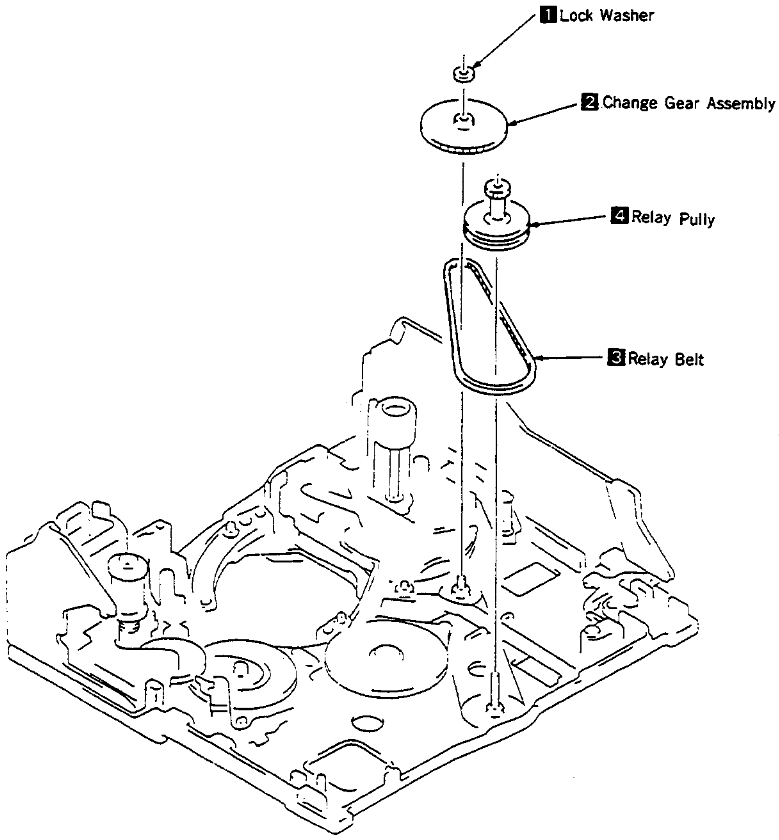
2. Mounting

*Give one or two drips of oil to the conversion gear shaft and relay pulley shaft respectively. (Oiling range is under the neck as shown in Fig. a.)

1) Hooking the relay belt ❸ to the relay pulley ❹ and Change gear assembly ❷, mount respective parts.
   *At first, insert the relay pulley into the mechanical chassis-shaft, then the change gear assembly by engaging with the capstan motor gear.

Note : Take care not to damage the Change gear by the capstan motor gear.

2) Mount a lock washer ❶.
3) Referring to 3-16, mount the pinch press arm assembly.
4) Referring to 3-18, mount the GL arm asembly.
5) Referring to 3-17, mount the cam.
6) Referring to 3-15, mount the M slider assembly.
7) Referring to 3-14, mount the LS arm assembly.
8) Referring to 3-7, mount the LS chassis assembly.
9) Referring to 3-3, mount the drum assembly.
10) Referring to 3-2, mount the protector base assembly.
11) Referring to 3-1, mount the Retainer, Gooseneck assembly.
12) Referring to 1-1, mount the cassette compartment assembly.



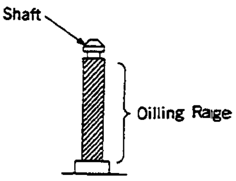


Fig. a

Fig. 28

3-21. ROTARY UPPER DRUM REPLACEMENT

1. Removoal

- If possible, make a recording before removal.

1) Remove the two screws 1 (Fig. 29).
2) Mount the jig 2 (Ref. No. J-10) with the two supplied screws 3, then screw the attached hexagon socket screws 4 to the jig 2. The rotary upper drum 5 will move upward and come off (Fig. 30).

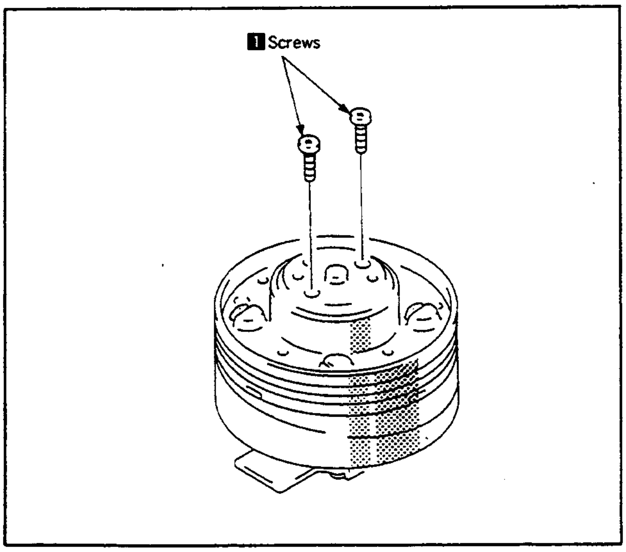


Fig. 29

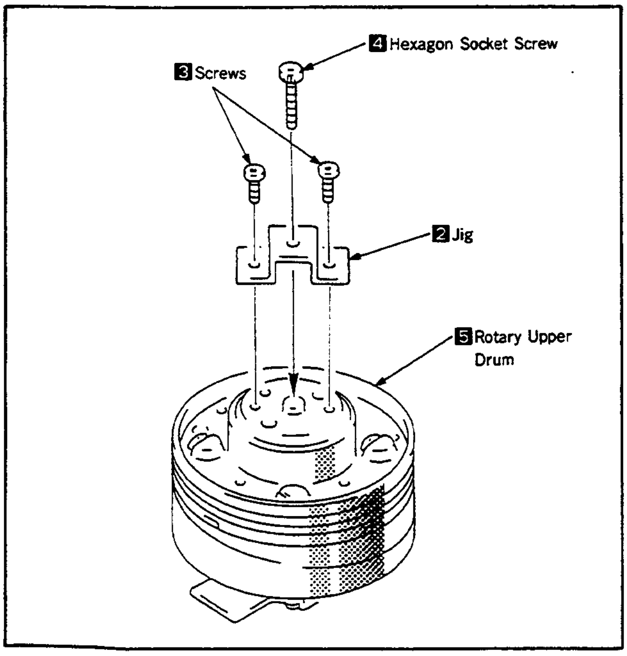


Fig. 30

2. Installation

1) Wipe clean the flange surface and the rotary upper drum 5 surface that makes contact with it, and confirm that they are free from dirt and scratches.
2) Insert the jig 6 (Ref. No. J-10) into the drum positioining hole, then set then set the rotary upper drum 5 by passing the jig through its positioning hole 7. (Fig.31)
3) Remove the jig 6 and push down the rotary upper drum 5 gently by hand. If it does not go all the way down, secure it temporarily by tightening the two screws 1 alternately (Fig.29).
4) Insert the jig 6 into the positioning hole 7 again and confirm that it goes in smoothly. If it does not, loosen the two screws 1, repeat step 2) of the Removal paragraph and restart the setting procedure.
5) Tighten the screws 1.

Note : After installing, be sure to perform tape path adjustment as described in section 4.

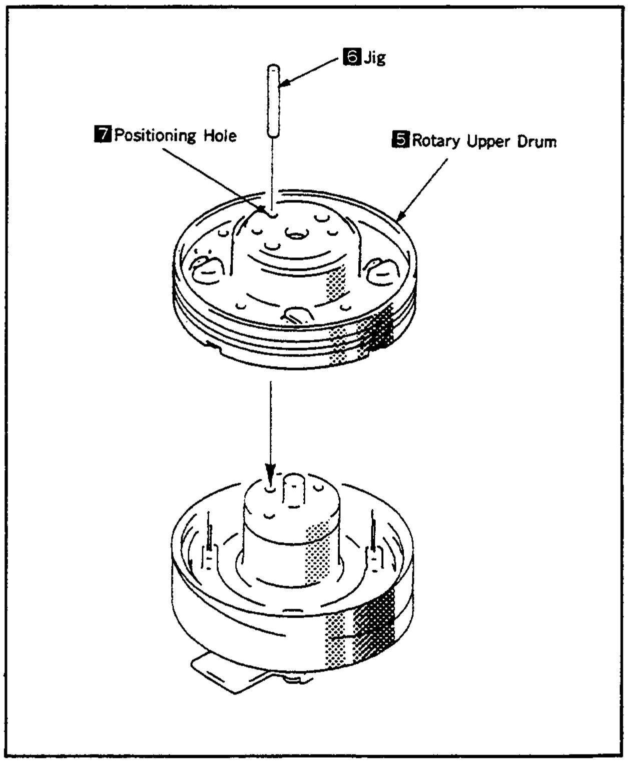


Fig. 31

3-22. ADJUSTMENT OF TENSION REGULATOR POSITION (Fig. 32)

1. Adjustment

1) Set a cassett tape and run the tape in the PB mode.
2) With the tape running, check that the distance from No.1 guide to No. 2 guide upper flange is 4.2 mm.
3) If they are not at the specified positions, perform adjustment in step 4) and subsequent steps.
4) Loosen the screw ❶.
5) If No.1 guide is located inside the specified position, shift the string block toward the arrow Ⓐ using the FWD B.T. adjusting driver (Ref No. J-15). Or, if it is located outside, shift toward the arrow Ⓑ.
6) Tighten the screw ❶.

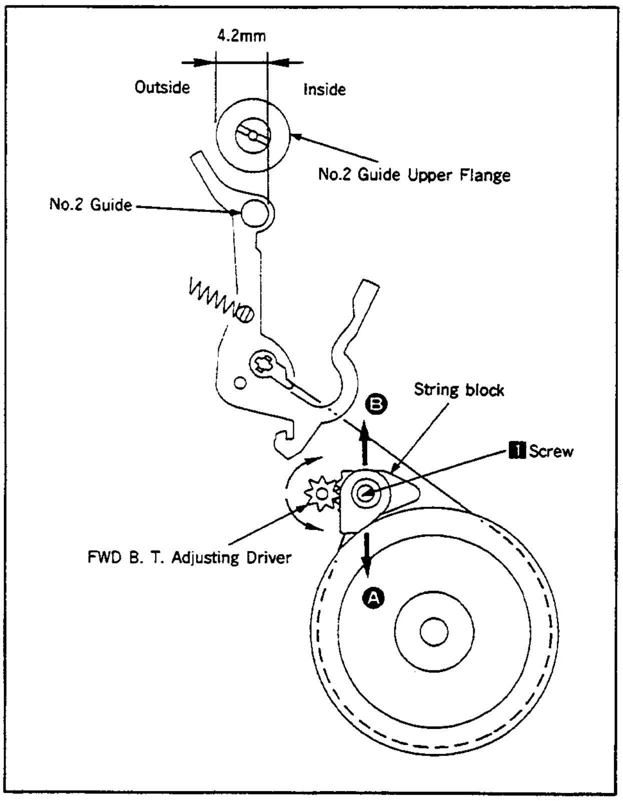

4.2mm
Outside
Inside
No.2 Guide Upper Flange
No.2 Guide
String block
Ⓑ
❶ Screw
FWD B. T. Adjusting Driver
Ⓐ

Fig. 32

3-23. FWD BACK TENSION ADJUSTMENT (Fig.33)

1) Select the TEST mode 1 using the adjusting remote controller (Ref No. J-17).
2) Set the torque cassette (Ref No.J-10).
3) Select the FWD mode, and check that the torque of S reel table is 8.5 ~ 11.5 g · cm.
   If it is out of standard, adjust the TG-1 spring hook position using the FWD B.T. adjusting driver (Ref No. J-15).

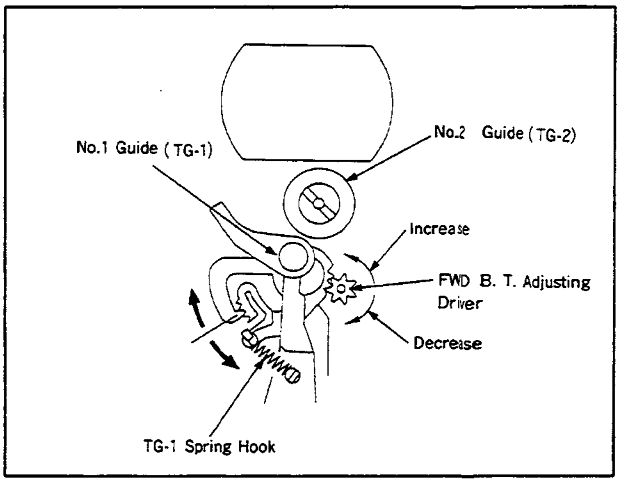

No.1 Guide (TG-1)
No.2 Guide (TG-2)
Increase
FWD B. T. Adjusting Driver
Decrease
TG-1 Spring Hook

Fig. 33

3-24. REEL TORQUE CHECK

1) Set the torque cassette.
2) Select the FWD mode, and check that the torque fluctuation center of T reel table is 7 ~ 17 g · cm
3) Select the REV mode, and check that the torque fluctuation center of S reel table is 25 ~ 39 g · cm.
4) Select the REV mode, and check that the torque of T reel table is 7 ~ 17 g · cm.
5) If the above data is not satisfied, the tension regulator band, T hard tab or T soft assembly will be faulty. Check them first, and if no abnormality is found, replace respective reel tables.

4. TAPE PATH ADJUSTMENT

The 8mm video system uses ATF (Automatic Track Finding) which instantaneously controls a tape running speed based on 4 types of pilot signals and performs high-precision tracking.
This does away a tracking control knob and allows accurate track tracing.
On the other hand, however, the ATF system has a problem in adjusting the tape path system. That is, if head tracing is out of order a little, the ATF automatically corrects it, which means that perfect adjustment cannot be done.
Therefore, in the A mechanism, the ATF system is forcibly operated to shift a tracking amount constantly (approx. 1/4) by setting the PATH mode with the adjusting remote controller (Ref No.J-16). So, fine tracking adjustment can be easily done. Also, the PATH mode setting varies with the model, and therefore, refer to the Service Manual.

Example) For CCD-FX410 series
Set the adjusting remote controller to the HOLD ON side.

1) Set PAGE : 1, ADDRESS : 00, DATA : 01 to cancel the PROTECT mode.
2) Set PAGE : D, ADDRESS : 01, DATA : 03 to select the PATH mode.

Note : Setting of PATH mode = TRACK SHIFT mode
If the adjusting remote controller (Ref No.J-16) is set to HOLD OFF once, then set to HOLD ON again after mode setting, the display of ADDRESS and DATA changes.

3) After adjustment is over, set DATA : 00, and press the PAUSE buttom on the adjusting remote controller (Ref No. J-16).

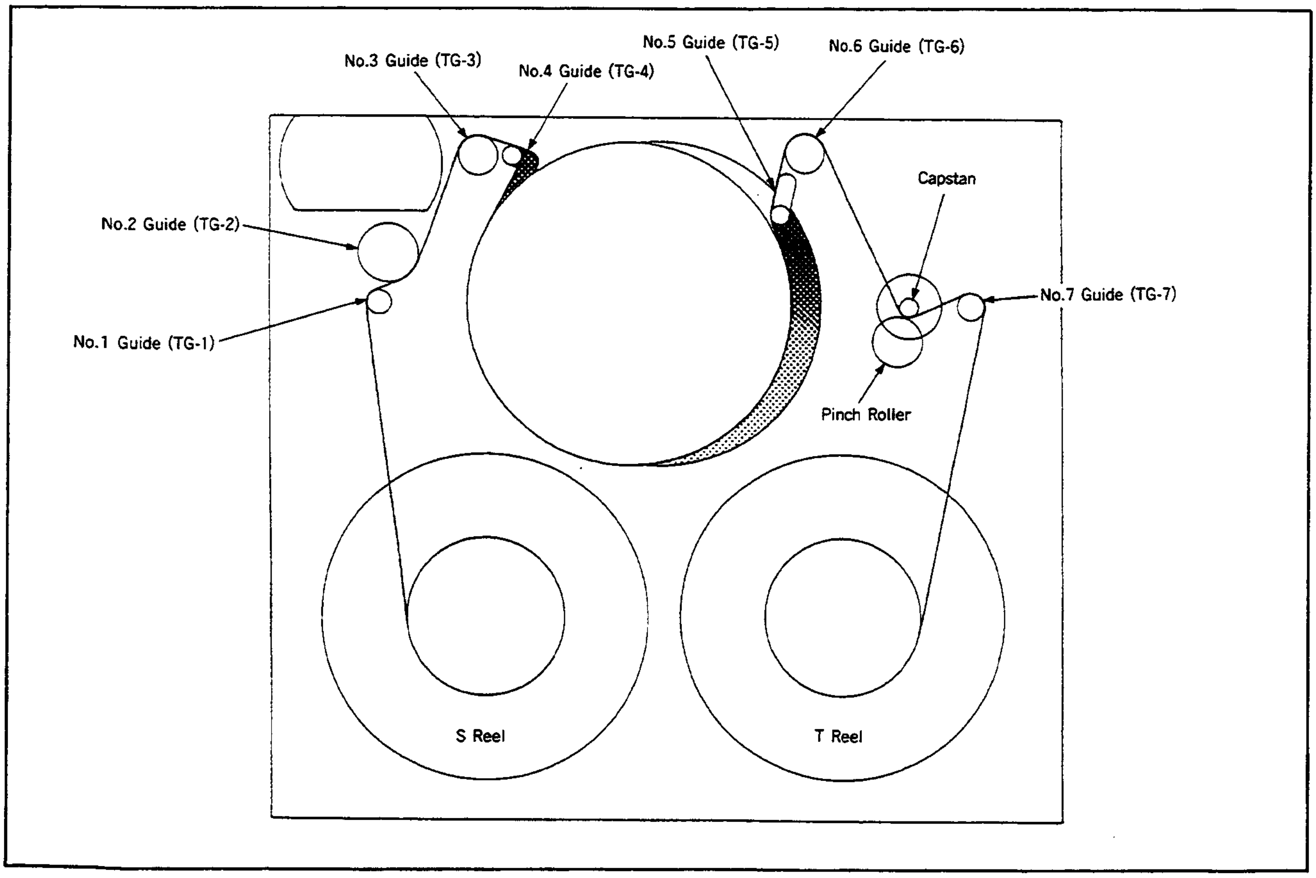


Fig. 34-A

[Note on Adjustment of No.7 Guide (TG-7)]

The height adjustment screw for No.7 guide (TG-7) is located at some distance from the guide (refer to Fig.41).
Therefore, when performing section 4-4. No.7 Guide (TG-7) Adjustment it is convenient to use the alignment tape for tracking (Ref. No. J-6), modified as follows, and perform adjustment in playback mode.

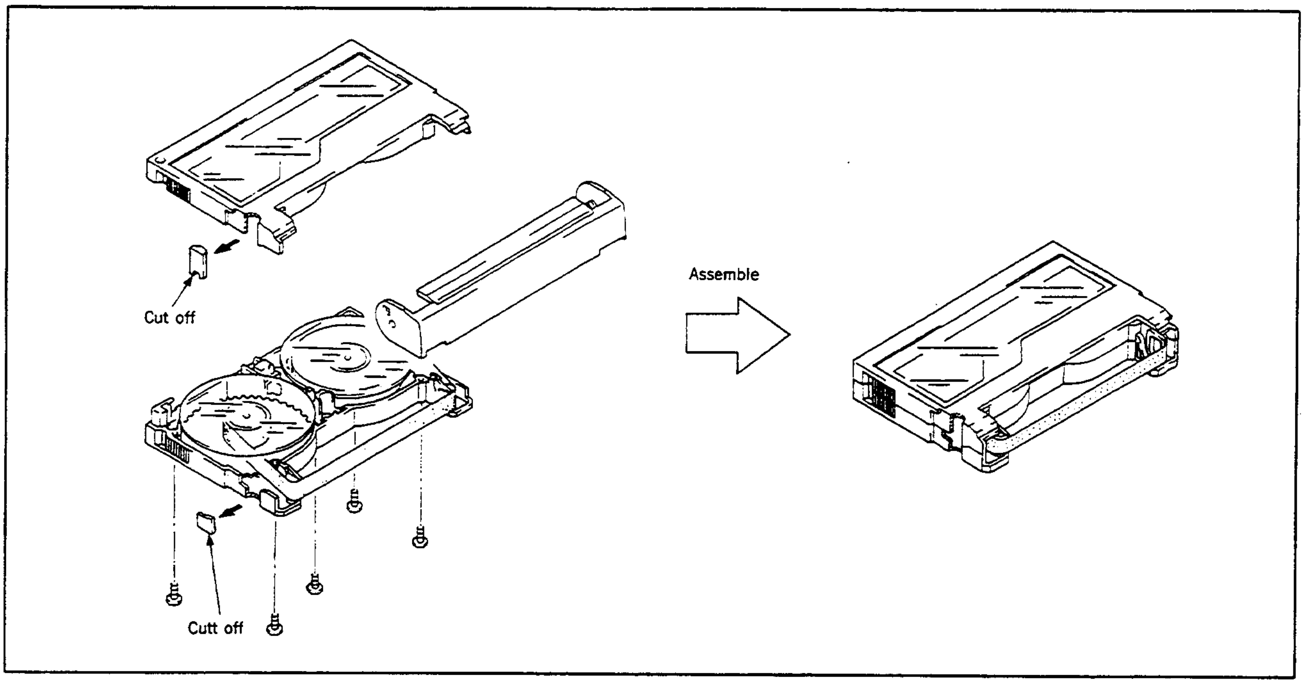


Fig. 34-B

4-1. PREPARATION FOR ADJUSTMENT

1) Clean the tape running surface (tape guides, drum, capstan shaft, pinch roller) (Fig. 34-A).
2) Set the PATH mode using the adjusting remote controller.
3) connect an oscilloscope to the check pin connector of the set.
   Example) For CCD-FX410 series
      CH1 : CN001 pin ③ (PB RF OUT) on CS-31 board
      CH2 : CN001 pin ④ (RF SWP) on CS-31 board
4) Play back a tracking alignment tape (NTSC : WR5-1N, or PAL : WR5-1C).
5) Check that a RF waveform is flat at the inlet and outlet of the oscilloscope (Fig. 35 ⓐ).
   If not flat, make adjustment with the procedures below.
   When the RF waveform is not flat at the inlet/outlet ; See Fig. 35 ⓑ and ⓒ.

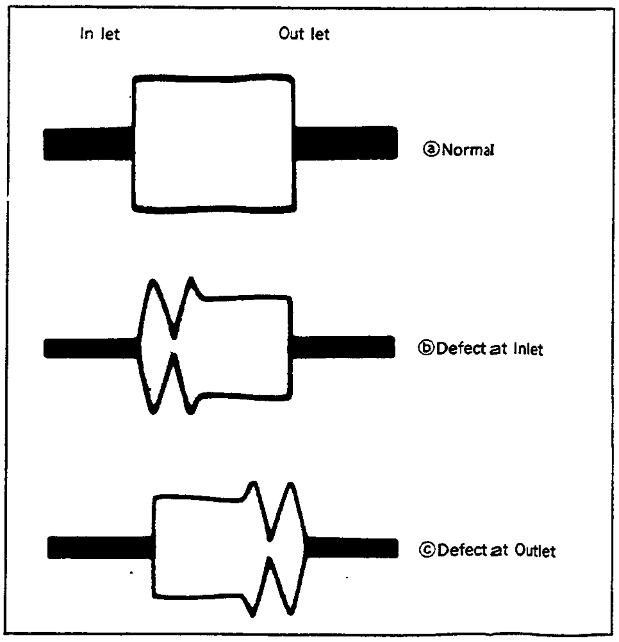


Fig. 35

4-2. TRACKING ADJUSTMENT (Fig. 36, 37)

1) Play back the tracking alignment tape.
2) Loosen the No.3 guide (TG-3) lock screw ❶ and turn the No.3 guide to flatten the waveform at the inlet.
3) Tighten the No.3 guide (TG-3) lock screw ❶ to lock the No.3 guide.
4) Loosen the No.6 guide (TG-6) lock screw ❷ and turn the No.6 guide to flatten the waveform at the outlet.
5) Tighten the No.6 guide (TG-6) lock screw ❷ to lock the No.6 guide. When this is done, make sure that the waveform does not change at the outlet.

Note : Be careful not to loosen the lock screw too much because the guide is easily moved.
: Take care not to allow interference between No.6 guide and drum when tightening the No.6 guide lock screw.

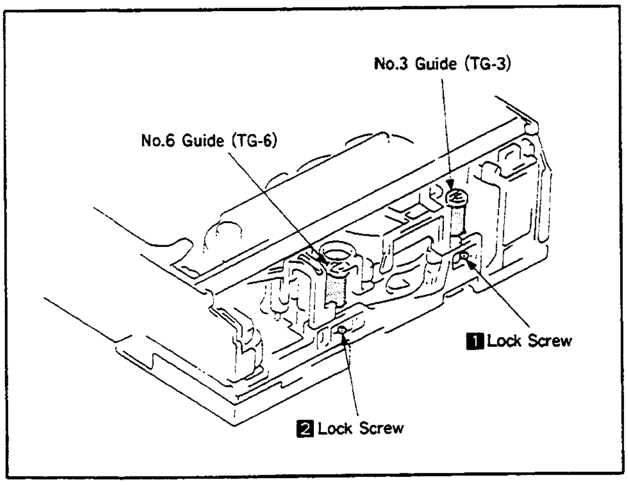


Fig. 36

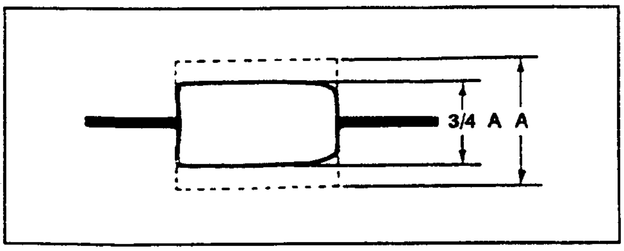


Fig. 37

4-3. No.2 GUIDE (TG-2) ADJUSTMENT

When the No.2 guide has been turned or replaced, perform height presetting before this adjustment.

4-3-1. No. 2 GUIDE (TG-2) HEIGHT PRESETTING (Fig. 38)

1) Rotating the TG-2 upper flange, adjust the height of bottom face of TG-2 lower flange from the top face of dowel on the mechanical chassis to 3.3 ± 0.05 mm.

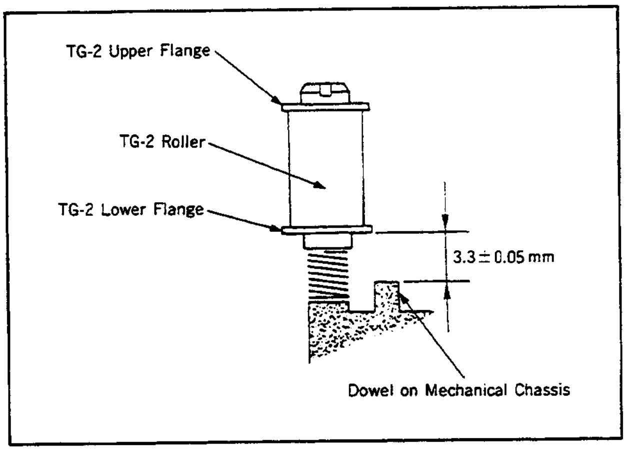


Fig. 38

[Reference]
This A mechanism is equipped with four adjustable guides (TG-2, 3, 6 and 7) . To raise or lower the respective guide rotate the corresponding adjustment screw as shown below.

Guide	Guide adjustment	Rotating direction of adjustment screw
TG-2, 3, 6	Raise	Counterclockwise
	Lower	Clockwise
TG-7	Raise	Clockwise
	Lower	Counterclockwise

4-3-2. No. 2 GUIDE (TG-2) ADJUSTMENT (Fig. 39, 40)

1) Play back a thin tape like the P6-120MP, etc. and set the REV mode.
2) Confirm that the tape is not bent at the lower flange 2 of the No.2 guide (TG-2) 1 (Fig. 39). If it is, turn the upper flange 3 of the No.2 guide (TG-2) clockwise with a screwdriver, lowering it until the tape is straightened.
3) Play back the alignment tape for tracking adjustment.
4) Perform tracking adjustment and trcking fine adjustment as described in sections 4-2.
5) In the track shift mode, CUE/REV the tape, then play it back and confirm that the RF waveform rises flat within 2 seconds.
6) If the waveform is not normal (Fig. 40), turn the upper flange 3 of the No. 2 guide (TG-2) 1 90° counterclockwise and repeat step 5.
   Repeat steps 5) and 6) until a normal waveform is obtained.
   Then, confirm that the tracking waveform has not changed.
   If it has, perform fine adjustment of entrance side tracking and repeat step 5).

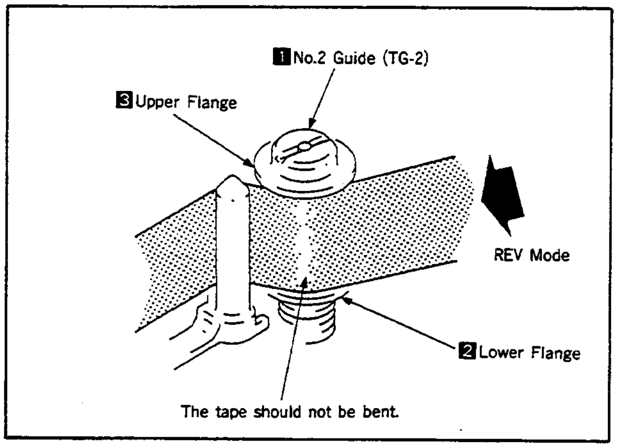


Fig. 39

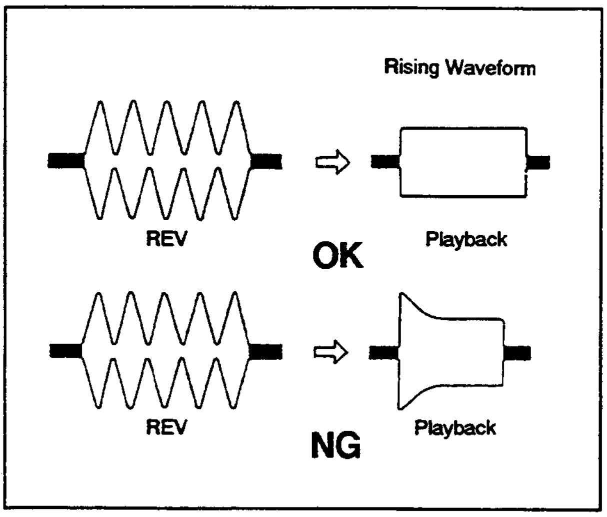


Fig. 40

4-4. No.7 GUIDE (TG-7) ADJUSTMENT (Fig. 41)

Note : This adjustment requires the No. 7 guide adjusting cassetetape (Fig. 34-B).

1) Play back the No.7 guide adjusting cassetetape and set the REV mode.
2) Confirm that the tape is not bent between the No.6 guide (TG-6) 1 and the capstan 2. If it is, turn the hight adjusting screw 4 of the No.7 guide (TG-7) 3 until the tape is straightened.
3) Set the playback mode again and confirm that the tape is not bent between the capstan 2 and the hight adjusting screw 4 of the No.7 guide (specification : 0.5mm or less). If the tape is bent beyond the specification, turn the No.7 guide (TG-7) 3 until bending is within the specification (0.5mm).
   If in the REV mode tape bending between the No. 6 guide (TG-6) 1 and the capstan 2 is 0.3mm or less, adjustment can be considered completed.

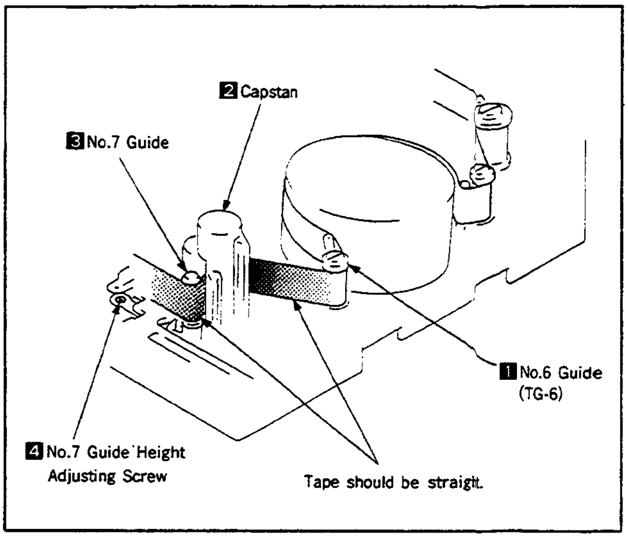


Fig. 41

4-5. CUE AND REV WAVEFORM CHECK (Fig. 42)

1) Play back the alignment tape for tracking adjustment and set the REV mode. Confirm that waveform peaks maintain a constant pitch of 5 seconds or more (Fig. 42). In case pitch is not constant, perform section 4-2.Tracking Fine Adjustment and section 4-4. No.7 Guide Adjustment.
2) Set the CUE mode. Confirm that waveform peaks still maintain a constant pitch of 5 seconds or more (Fig.42).
   Otherwise, perform section 4-2 Tracking Fine Adjustment.

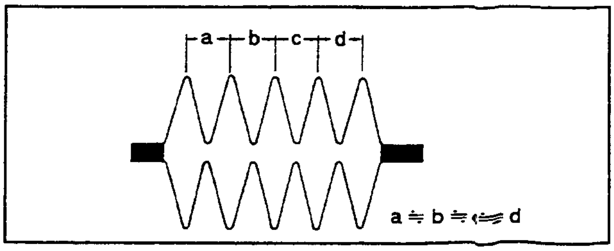


Fig. 42

4-6. CHECK AFTER ADJUSTMENT

4-6-1. TRACKING CHECK

1) Confirm that the amplitude of RF waveform is reduced to approx. 3/4 when the track shift mode is set (Fig. 43).
2) Then, confirm that the minimum amplitude value (EMIN) is 65 % of the maximum value (EMAX) or larger (Fig. 44).
3) Confirm that no large fluctuations occur on the waveform (Fig. 45).

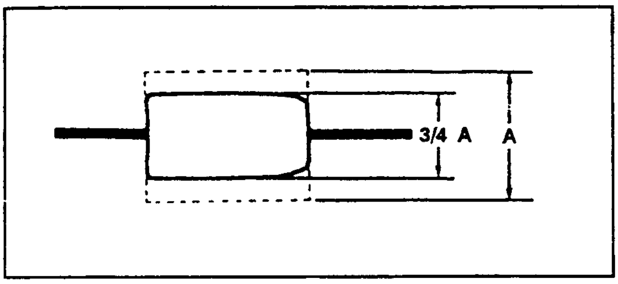


Fig. 43

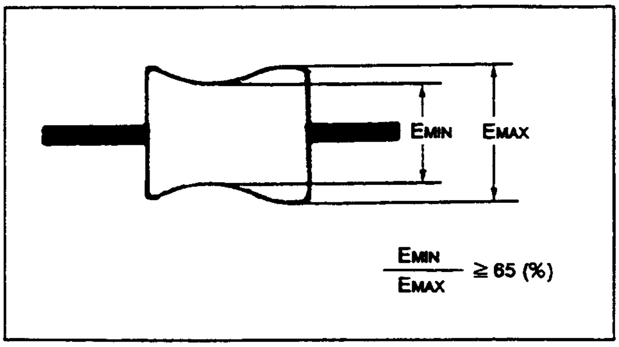

EMIN
EMAX
EMIN / EMAX ≧ 65 (%)

Fig. 44

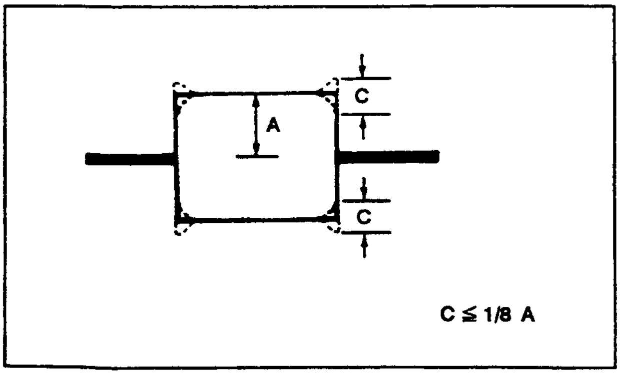


Fig. 45

4-6-2. RISING CHECK (Fig. 46)

1) Play back the alignment tape for tracking adjustment.
2) Cancel the track shift mode.
3) Eject the tape, then load it again.
4) Set the playback mode and confirm that the RF wave form rises flat within 2 seconds. Also confirm that the tape is not bent around the pinch roller.
5) CUE/REV and FF/REW the tape, then play it back and confirm that the RF waveform rises flat within 2 seconds, Also confirm that the tape is not bent around the pinch roller.
6) Repeat steps 3) to 5) once more.

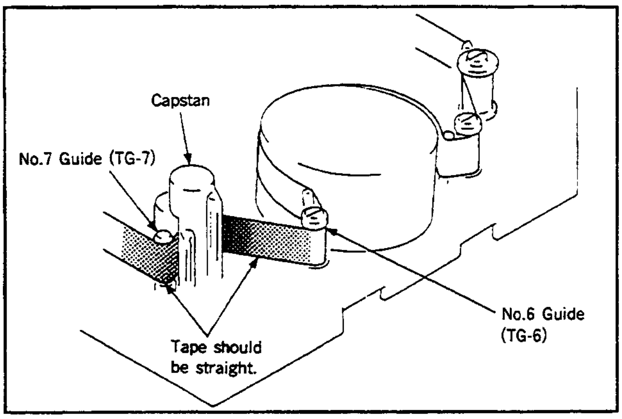

Capstan
No.7 Guide (TG-7)
No.6 Guide (TG-6)
Tape should be straight.

Fig. 46

4-6-3. TAPE PATH CHECK (Fig. 47)

1) Play back a thin tape like the P6-120MP (NTSC) or P5-90MP (PAL), etc. and confirm that no tape rising occurs, and that curling is less than 0.3mm, at the lower flange of the No. 2 guide , the upper flange of the No.3 guide, the upper flange of the No. 6 guide and the No.7 guide upper and lower flanges.
2) Confirm that no tape rising occurs and that curling is less than 0.3mm at the flange of all guide when pressing the FF button in the playback mode to set the CUE mode, or the REW button to set the REV mode.

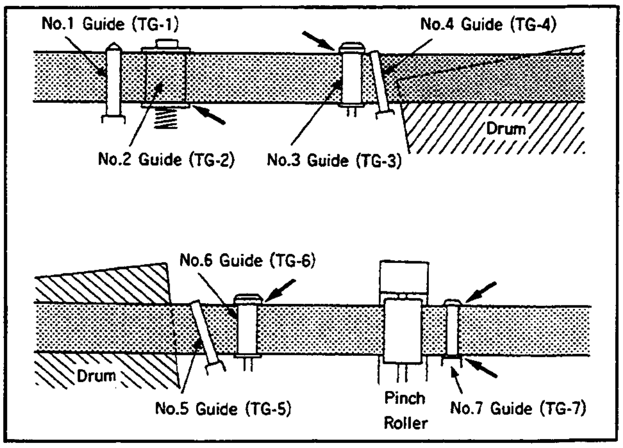

No.1 Guide (TG-1)
No.4 Guide (TG-4)
Drum
No.2 Guide (TG-2)
No.3 Guide (TG-3)
No.6 Guide (TG-6)
Drum
No.5 Guide (TG-5)
Pinch Roller
No.7 Guide (TG-7)

Fig. 47

8mm Video MECHANICAL ADJUSTMENT MANUAL IV

A MECHANISM

SUPPLIMENT-2

Video 8

<Connection of Mode Selector IV Conversion Connector>

In use of Mode selector IV conversion connector(J-6082-167-A), there are two different connecting methods depending on the model connected:

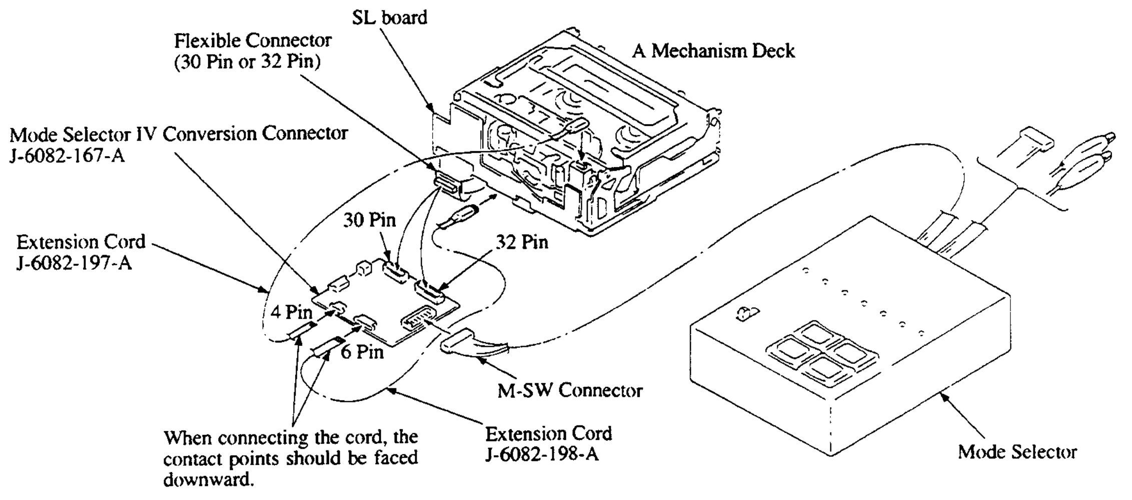
1. CCD-FX series

With the SL board mounted on mechanical deck, connect 30-pin(or 32-pin) connector to 30-pin(or 32-pin) Mode selector IV conversion connector.

(CCD-FX300 series, FX400 series. FX500 series
→ 30-pin connector (FP425 or FP600)
CCD-FX700 series → 32-pin connector (FP477))

2. Models other than above

Connect the extension cord(J-6082-197-A) to loading motor 4-pin connector and extension cord (J-6082-198-A) to mode switch 6-pin connector in mechanical deck, then connect the other end of cord to 4-pin and 6-pin connectors of Mode selector IV conversion connector respectively, as shown below.


SL board
Flexible Connector
(30 Pin or 32 Pin)
A Mechanism Deck
Mode Selector IV Conversion Connector
J-6082-167-A
30 Pin
32 Pin
Extension Cord
J-6082-197-A
4 Pin
6 Pin
M-SW Connector
When connecting the cord, the contact points should be faced downward.
Extension Cord
J-6082-198-A
Mode Selector

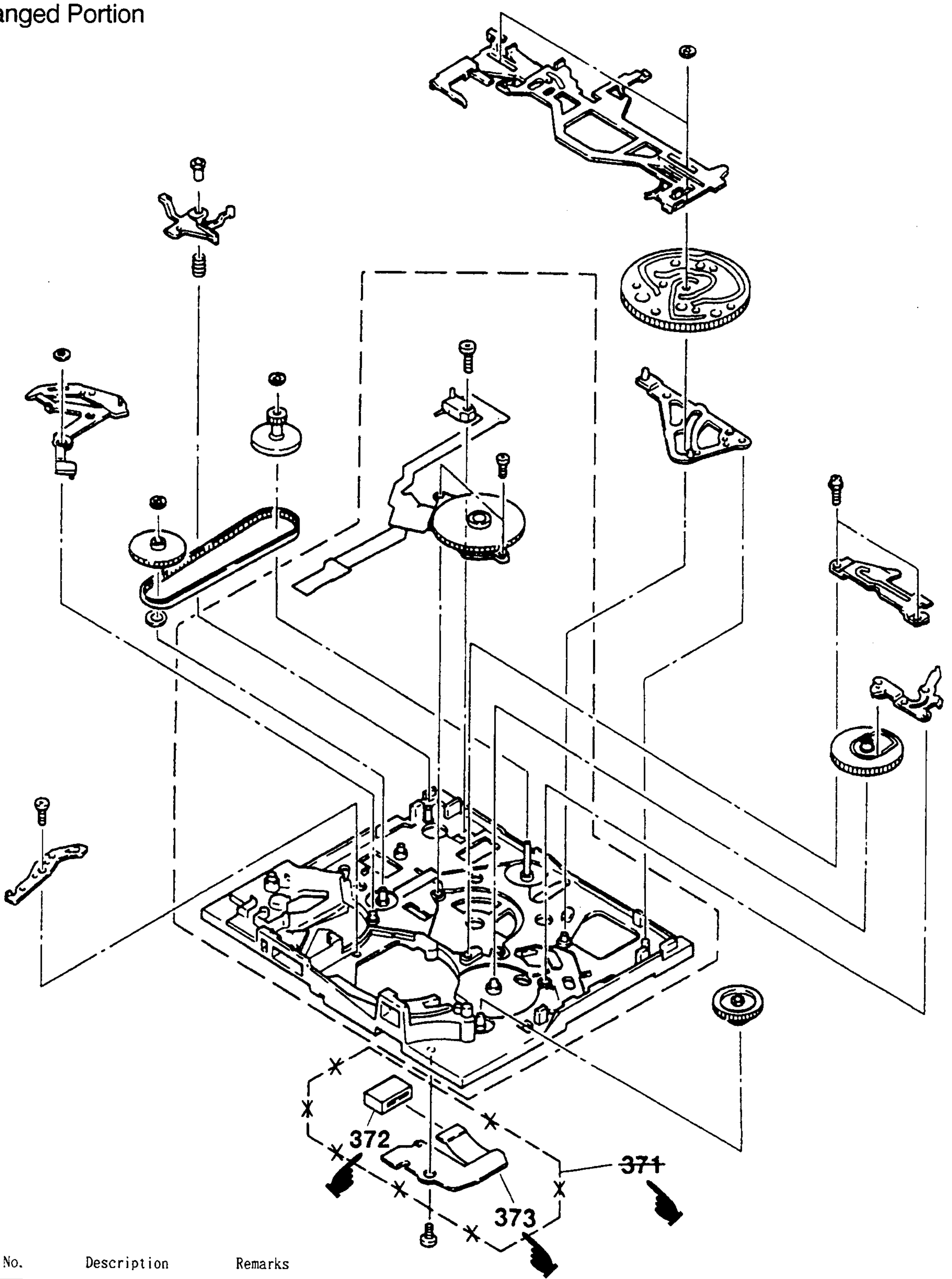
<CORRECTION>

P10. 2-4 Service jigs list

		Incorrect		Correct
J-15	FWD B.T adjusting driver	J-6082-182-A	➜	J-6082-187-A

MECHANISM CHASSIS ASSEMBLY (2)

☛ : Changed Portion



Ref.No.	Part No.	Description	Remarks
~~371~~	~~A-7040-311-A~~	~~FP-444 ASSY~~	☛
372	1-691-254-13	CONNECTOR, TRANSLATION 10P	☛
373	1-641-639-13	FP-442 FLEXIBLE BOARD	☛

9-973-199-84

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8mm Video MECHANICAL ADJUSTMENT MANUAL IV

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